This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

970

ARMY MEDICAL DEPARTMENT

REPORT

FOR THE YEAR 1896.

WITH APPENDIX.

VOLUME XXXVIII.

LONDON:
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
BY HARRISON AND SONS,
PRINTERS IN ORDINARY TO HER MAJESTY.

And to be purchased, either directly or through any Bookseller, from
EYRE AND SPOTTISWOODE, EAST HARDING STREET, FLEET STREET, E.C.; or
JOHN MENZIES & Co., 12, HANOVER STREET, EDINBURGH, and
90, WEST NILE STREET, GLASGOW; or
HODGES, FIGGIS, & Co., LIMITED, 104, GRAFTON STREET, DUBLIN.

1897.

Price Two Shillings and Fourpence.

TO THE RIGHT HONOURABLE

THE SECRETARY OF STATE FOR WAR.

My Lord,

I have the honour to submit the accompanying Report on the Health and Sanitary Condition of the Army for the year 1896.

I have the honour to be,
My Lord,
Your Lordship's most obedient Servant,
J. JAMESON,
Director-General.

Medical Division, War Office,
14*th December* 1897.

CONTENTS.

PAGE

Letter from the Director-General to the Secretary of State for War - iii

REPORT.

I. Summary of the Health of European Troops at all Stations - 1

II. On the Health of the Troops serving in the UNITED KINGDOM—
- Sickness and Mortality - 4
- Invaliding - 16
- On the influence of Age and Service on Sickness, Mortality, and Invaliding - 17
- Remarks on the Prevalence of Sickness in Military Districts - 18
- Admissions, Deaths, and Invaliding, &c., in the different Arms of the Service - 20
- Health Statistics of Corps - 21
- Officers, Women and Children - 22
- Vaccination - 27
- On the Recruiting of the Army - 30
  - Number of Recruits Inspected and Rejected - 30
  - Native Countries of Recruits inspected - 30
  - Previous Occupations of Recruits - 31
  - Causes of Rejection of Recruits - 31
  - Ages of Recruits - 33
  - Tables showing the Heights, Weights, and Chest Measurements of Recruits - 34
  - Extent of Education of Recruits - 37

SANITARY CONDITIONS of HOME STATIONS.

- North-Eastern District - 38
- North-Western District - 40
- Eastern District - 43
- Western District - 44
- Southern District - 47
- Netley - 49
- Thames District - 49
- South-Eastern District - 51
- Home District - 52
- Woolwich District - 54
- Aldershot - 54
- Channel Islands - 56
- Scottish District - 57
- Ireland:
  - Belfast District - 58
  - Dublin District - 59
  - Cork District - 62
  - Curragh District - 64

PAGE

III. On the Health of the Troops serving in the MEDITERRANEAN—
  I. Gibraltar:
    Sickness and Mortality - - - - - - 66
    Sanitary Conditions - - - - - - 71
  II. Malta:
    Sickness and Mortality - - - - - - 72
    Sanitary Conditions - - - - - - 77
   Royal Malta Artillery:
    Sickness and Mortality - - - - - - 79

IV. On the Health of the Troops serving in the DOMINION OF CANADA—
    Sickness and Mortality - - - - - - 81
    Sanitary Conditions - - - - - - 84

V. On the Health of the Troops serving in BERMUDA—
    Sickness and Mortality - - - - - - 86
    Sanitary Conditions - - - - - - 89

VI. On the Health of the Troops serving in the WEST INDIES—
  I. European Troops:
    Sickness and Mortality - - - - - - 91
    Sanitary Conditions - - - - - - 95
  II. Non-European Troops:
    Sickness and Mortality - - - - - - 96

VII. On the Health of the Troops serving in WESTERN AFRICA—
  I. European Troops:
    Sickness and Mortality - - - - - 101
  II. Non-European Troops:
    Sickness and Mortality - - - - - 101
    Sanitary Conditions - - - - - 104

VIII. On the Health of the Troops serving in SOUTH AFRICA AND ST. HELENA—
    Sickness and Mortality - - - - - 106
    Sanitary Conditions - - - - - 111

IX. On the Health of the Troops serving in the MAURITIUS—
  I. European Troops:
    Sickness and Mortality - - - - - 113
    Sanitary Conditions - - - - - 116
  II. Non-European Troops:
    Sickness and Mortality - - - - - 117

X. On the Health of the Troops serving in CEYLON—
  I. European Troops:
    Sickness and Mortality - - - - - 118
    Sanitary Conditions - - - - - 122
  II. Asiatic Troops:
    Sickness and Mortality - - - - - 123

XI. On the Health of the Troops serving in CHINA—
  I. European Troops:
    Sickness and Mortality - - - - - 124
    Sanitary Conditions - - - - - 128
  II. Asiatic Troops:
    Sickness and Mortality - - - - - 128

PAGE

XII. On the Health of the Troops serving in the STRAITS SETTLEMENTS—
  I. European Troops:
    Sickness and Mortality - - - - - 130
    Sanitary Conditions - - - - - 133
  II. Asiatic Troops:
    Sickness and Mortality - - - - - 134

XIII. On the Health of the European Troops serving in INDIA—
    Sickness and Mortality - - - - - 135
    Sanitary Conditions - - - - - 173

XIV. On the Health of the Troops serving in EGYPT AND CYPRUS—
    Sickness and Mortality - - - - - 204
    Sanitary Conditions - - - - - 212

XV. On the Health of the Troops on BOARD SHIP—
  I. Troops proceeding on Service Abroad - - - 215
  II. „ returning from ditto - - - - - 216
  III. „ proceeding from one Station abroad to another - 217
  IV. Invalids returning to England - - - - 218
  V. Sanitary condition of ships - - - - - 218

ABSTRACTS—HOME.

No. I.—United Kingdom, Summary of the Health of the Troops serving in - - - - - - 220
  A.—England, ditto - - - - - 222
  B.—Scotland, ditto - - - - - 224
  C.—Ireland, ditto - - - - - 226
  D.—Summary of the Health of the Officers, Women, and Children in the United Kingdom - 228

ABSTRACTS—COLONIAL STATIONS.

No. II.—Gibraltar, Summary of the Health of the Troops serving in - - - - - - - 230
  III.—Malta, ditto - - - - - - 232
  IIIA.—Royal Malta Artillery, ditto - - - - 234
  IV.—Dominion of Canada, ditto - - - - 236
  V.—Bermuda, ditto - - - - - - 238
  VI.—West Indies, European Troops, ditto - - - 240
  VII.—Ditto, Non-European Troops, ditto - - - 242
  VIII.—West Africa, ditto - - - - - 244
  IX.—South Africa and St. Helena, European Troops, ditto - 246
  X.—Mauritius, ditto - - - - - - 248
  XI.—Ceylon, ditto - - - - - - 250
  XII.—China, ditto - - - - - - 252
  XIII.—Straits Settlements, ditto - - - - 254

ABSTRACTS—INDIA.

No. XIV.—Summary of the Health of the Troops serving in - 256
  XV.—Admissions and Deaths by Classes of Diseases in each of the Military Divisions - - - - 258
  XVI.—Admissions and Deaths at the chief Stations - - 266
  XVII.—Enteric Fever - - - - - - 270
  XVIII.—Cholera - - - - - - 274
  XIX.—Dysentery, Diarrhœa, and Hepatitis in each Division - 275
  XX.—Ditto, Seasonal prevalence - - - - 276

PAGE

ABSTRACTS—MISCELLANEOUS.

No. XXI.—Egypt and Cyprus.—Summary of the Health of the Troops serving in - - - - - - 278
XXII.—Troops on Board Ship, Summary of the Health of the - 280
XXIII.—Influence of Age on Mortality in Commands Abroad - 282
XXIV.—Health Statistics of Corps in the United Kingdom - 283
XXV.—Health Statistics of Corps in Commands Abroad, exclusive of India - - - - - 297
XXVI.—Health Statistics of Corps in India - - - 312

APPENDICES.

PAGE

I.—Report on the Progress of Hygiene for the year 1897. By Surgeon-Colonel J. Lane Notter, M.A., M.D., Army Medical Staff, Professor of Military Hygiene at the Army Medical School, Netley - - - - - - 323

II.—List of Operations, 1897. With three plates. By Surgeon-Colonel W. F. Stevenson, Army Medical Staff, Professor of Military Surgery, and Surgeon-Major W. Dick, M.B., Assistant Professor, Army Medical School, Netley - - 342

III.—General Report of the Medical History of the Chitral Relief Force. By Surgeon-Major-General T. Maunsell, C.B., Army Medical Staff, late Principal Medical Officer, Chitral Relief Force - - - - - - 351

IV.—Report on Medical Transactions of the British Troops of the Dongola Expeditionary Force, from 22nd March 1896 to 13th October 1896. By Surgeon-Lieut.-Colonel A. T. Sloggett, Army Medical Staff, Senior Medical Officer, British Troops - - - - - - 380

V.—Report on the Medical Transactions of Bechuanaland, Matabeleland, and Mashonaland Field Forces, during the period from 8th May 1896 to 3rd January 1897:—

i.—The Bechuanaland and Matabeleland Field Forces. By Surgeon-Lieut.-Colonel J. A. Gormley, M.D., Army Medical Staff, late Senior Medical Officer, Imperial Contingent - - - - 390

ii.—The Mashonaland Field Force. By Surgeon-Captain F. A. Saw, M.B., Army Medical Staff - - 398

VI.—Report of Medical Transactions, &c., Niger Expeditionary Force. By Surgeon-Captain C. L. Josling, Army Medical Staff - - - - - - - 405

VII.—Report on the Seventh Annual Session of the Association of United States Military Surgeons, held at Columbus, Ohio, May 25–27, 1897. By Hon. Deputy-Surgeon-General W. S. Oliver, M.D., Retired Pay, Army Medical Department - - - - - - - - 408

VIII.—Report on the 12th International Medical Congress, held at Moscow in August 1897. By Surgeon-Colonel W. F. Stevenson, M.B., Professor of Military Surgery, Army Medical School, Netley - - - - - 417

IX.—Report on Disordered Action of the Heart among Young Soldiers in India, with summary of cases. By Surgeon-Captain J. B. Wilson, M.D., Army Medical Staff - - 425

X.—On the Efficacy of Invaliding in the Treatment of Mediterranean Fever. By Surgeon-Major H. D. Rowan, M.B., Army Medical Staff. With temperature chart - - 433

XI.—Marching and its place in the Training of the Soldier. By Surgeon-Captain H. W. Austin, Army Medical Staff - 448

PAGE
XII.—On the Malarial Fevers of the West Coast of Africa. By Surgeon-Major R. Crofts, Army Medical Staff - - 456
XIII.—A Case of Phlegmon of the Face, followed by Sloughing of the Upper Eyelid, and partial suppression of Urine, with recovery. By Surgeon-Captain R. A. Bostock, 2nd Battalion Scots Guards - - - - - 463
XIV.—On the late Epidemic of Bubonic Plague in Sind, and more especially the Outbreaks at Karachi and Sukkur. By Surgeon-Captain A. L. Borradaile, M.B., Army Medical Staff - - - - - - - 466
XV.—Meteorological Observations at Netley and Stations Abroad, 1896 - - - - - - 470
XVI.—The Parkes Memorial Prize - - - - - - 484
XVII.—The Alexander Memorial Fund - - - 485

ARMY MEDICAL DEPARTMENT REPORT FOR 1896.

I.—HEALTH OF THE TROOPS AT HOME AND ABROAD.

Troops at Home and Abroad.

The average strength of European troops serving at home and abroad in 1896, as computed from the returns received by the Army Medical Department, was 203,145 warrant officers, non-commissioned officers and men, and in this force there were 191,513 admissions into hospital and 1,676 deaths. The ratios represented by these numbers are, for admission to hospital 942·7 and for deaths 8·14 per 1,000, the latter being calculated on a strength of 205,800, which includes detached men. There were also 53 European soldiers serving in West Africa, among whom there were 165 admissions into hospital and 3 deaths. Details respecting this force will, in future, be included in the statistical tables.

The statistics of the troops serving in the United Kingdom during the year show that the ratios of both sickness and mortality were lower than in 1895, and considerably below the average ratios for the preceding ten years. Only one admission for small-pox occurred as compared with 3 in 1895 and 11 in 1894. The admission rate for scarlet fever was below that of the previous year, but that of measles remained almost the same. Enteric fever showed a decided decline in the admission and mortality rates as compared with those for the previous year and the average ratios for the ten years 1886–95. Dublin was, as in previous years, the station most affected.

The general health of the troops in the Colonies was, on the whole, satisfactory, but at Malta continued fevers were more prevalent than in 1895, and in Ceylon and China malarial fevers were the cause of a large amount of sickness, but much of this sickness was attributed to the arrival of troops from malarial districts in India. A considerable increase in the admission rate for venereal diseases in the West Indies is recorded, and, as in the previous year, venereal disease shows excessive prevalence in China and the Straits Settlements. There was a marked diminution in the number of cases of enteric fever at Bermuda and of malarial fevers in Mauritius, as compared with the year 1895.

In India there was again a decline in the admission rate, but the ratio of constant inefficiency was fractionally higher than in the previous year. There was more sickness from enteric, other continued fevers and cholera. Malarial fevers, while less prevalent than in 1895, accounted for almost one-fifth of the total number of admissions. With regard to venereal disease, there was a notable increase in the sickness from secondary syphilis, but a decline in the other forms of venereal disease. The total admissions for venereal diseases accounted for more than one-third of the admissions into hospital.

The general health of the troops in Egypt was good, and the improvement noted in the reports for the two previous years still continued, but enteric fever and venereal diseases were the cause of more sickness than in 1895, the increase in the former being mainly due to disease contracted "Up Nile" during the Dongola expedition.

Troops at Home and Abroad.

The statistics of some of the most important of the results of sickness, in every Command in which the troops were stationed, are exhibited in the following Table :—

1896.

European Troops.	Average Strength.	Admitted into Hospital.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.
Troops at Home and Abroad - -	**203,145**	**191,513**	**1,676**	**2,518**	**3,304**	**12,177·65**
United Kingdom -	99,821	64,395	367	—	2,173	3844·93
Gibraltar - -	4,630	3,239	19	30	19	246·74
Malta - - -	8,316	6,602	66	178	68	433·52
Egypt and Cyprus -	3,916	3,220	52	36	29	247·23
Canada - - -	1,504	856	5	24	14	42·66
Bermuda - -	1,387	653	8	19	1	37·26
West Indies - -	1,293	1,539	8	26	14	101·37
South Africa and St. Helena - -	4,412	3,810	21	64	41	240·11
Mauritius - -	676	799	6	34	6	55·90
Ceylon - - -	1,336	1,765	11	31	10	86·72
China - - -	1,470	2,729	11	90	46	128·73
Straits Settlements -	1,352	1,453	12	20	3	97·74
India - - -	70,484	97,738	1,078	1,966	880	6614·74
On board Ship - -	2,548	2,715	12	—	—	—

1896.

European Troops.	Ratio per 1,000 of Strength.					Average sick-time to each Soldier.	Average duration of each Case of Sickness.
	Admitted.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.		
Troops at Home and Abroad -	**942·7** *	**8·14** †	**24·99** ‡	**16·26** §	**60·71** ‖	Days.‖ **22·22**	Days. **23·61**
United Kingdom -	645·1	3·58	—	21·20	38·52	14·10	21·85
Gibraltar - -	699·5	4·10	6·48	4·10	53·29	19·50	27·88
Malta - - -	793·9	7·93	21·40	8·18	52·13	19·08	24·03
Egypt and Cyprus -	822·3	13·28	9·19	7·40	63·13	23·11	28·10
Canada - -	569·1	3·32	15·96	9·31	28·36	10·38	18·24
Bermuda - -	470·8	5·77	13·70	·72	26·86	9·83	20·88
West Indies - -	1190·2	6·19	20·11	10·83	78·40	28·69	24·11
South Africa and St. Helena - -	863·5	4·76	14·50	9·29	54·42	19·92	23·07
Mauritius - -	1181·9	8·88	50·30	8·88	82·69	30·26	25·60
Ceylon - -	1321·1	8·23	23·20	7·48	64·91	23·76	17·98
China - - -	1856·5	7·48	61·22	31·29	87·57	32·05	17·26
Straits Settlements -	1074·7	8·88	14·79	2·22	72·29	26·46	24·62
India - - -	1386·7	15·29	27·89	12·48	93·85	34·35	24·77
On board Ship -	1065·5	4·71	—	—	—	—	—

* Calculated on strength excluding men detached (2,655).

† Calculated on strength including men detached.

‡ Calculated on strength excluding United Kingdom and troops on board ship.

§ Calculated on strength including men detached, and excluding troops on board ship.

‖ Calculations exclude men detached and troops on board ship.

Troops at Home and Abroad.

1886 to 1895.

European Troops.	Aggregate strength for 10 years.	Admitted into Hospital.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.
Troops at Home and Abroad	**1,978,171**	**2,000,635**	**18,262**	**22,913**	**28,397**	**113,789·50**
United Kingdom	995,190	751,361	5,057	—	16,151	43,129·58
Gibraltar	46,832	83,819	211	809	400	2,163·89
Malta	69,067	45,282	515	1,294	756	3,005·83
Egypt and Cyprus	53,002	56,696	864	1,760	788	3,566·55
Canada	13,724	6,855	59	199	172	852·25
Bermuda	13,833	7,953	148	178	133	418·93
West Indies	11,592	12,934	107	228	157	719·93
South Africa and St. Helena	33,807	29,139	223	830	508	1,867·74
Mauritius	5,190	7,237	85	287	95	377·62
Ceylon	12,042	12,091	137	236	142	696·28
China	13,459	16,904	154	386	162	826·25
Straits Settlements	11,971	12,921	87	207	119	839·08
India	673,241	978,564	10,451	16,499	8,814	55,825·57
On board Ship	25,221	28,879	164	—	—	—

1886 to 1895.

European Troops.	Ratio per 1,000 of Strength.					Average sick-time to each Soldier.	Average duration of each Case of Sickness.
	Admitted.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.		
						Days.	Days.
Troops at Home and Abroad	**1011·3**	**9·14**	**23·92**	**14·39**	**58·26**	**21·27**	**21·06**
United Kingdom	755·0	4·98	—	15·90	48·84	15·82	20·95
Gibraltar	722·1	4·50	17·27	8·54	46·20	16·86	23·35
Malta	655·6	7·45	18·78	10·94	43·52	15·88	24·23
Egypt and Cyprus	1069·7	16·30	33·21	14·87	67·29	24·56	22·96
Canada	499·5	4·30	14·50	12·53	25·66	9·37	18·75
Bermuda	574·9	10·70	12·87	9·61	30·28	11·05	19·23
West Indies	1115·7	9·23	19·67	13·54	62·11	22·67	20·32
South Africa and St. Helena	861·9	6·60	24·55	15·02	55·25	20·16	23·39
Mauritius	1394·4	16·37	55·30	18·30	72·76	26·56	19·04
Ceylon	1004·1	11·38	19·60	11·79	57·82	21·10	21·02
China	1256·0	11·44	28·68	12·08	61·39	22·41	17·84
Straits Settlements	1079·4	7·27	17·29	9·94	70·09	25·58	23·70
India	1453·5	15·52	24·51	13·09	82·92	30·26	20·82
On board Ship	1145·0	6·50	—	—	—	—	—

II.—ON THE HEALTH OF THE TROOPS SERVING IN THE UNITED KINGDOM.

Sickness and Mortality.

United Kingdom.

The average strength of warrant officers, non-commissioned officers and men who served in the United Kingdom during the year 1896 was 99,821, according to the returns furnished by medical officers. In addition to this there were certain men detached from their corps, the average number of whom is computed to have been 2,655.

The following table gives the most important of the statistics of sickness and mortality among the troops quartered in the three great divisions of the kingdom, England and Wales, Scotland, and Ireland, and also among those in the United Kingdom as a whole:—

1896.	Average Strength.	Admissions.	Deaths.	Invalids.	Constantly Sick.
England and Wales -	72,674	47,360	266	1,547	2887·03
Scotland - - -	3,530	1,956	15	72	84·60
Ireland - - -	23,617	15,079	86	554	873·30
United Kingdom -	99,821	64,395	367	2,173	3844·93

(*continued.*)

1896.	Ratios per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
	Ad-missions.	Deaths.*	Invalid-ing.*	Con-stantly Sick.	Days.	Days.
England and Wales -	651·7	3·59	20·89	39·72	14·54	22·31
Scotland - -	554·1	4·25	20·40	23·97	8·77	15·83
Ireland - -	638·5	3·45	22·20	36·98	13·53	21·20
United Kingdom -	645·1	3·58	21·20	38·52	14·10	21·85

* These ratios are calculated on a strength including the men detached.

Comparing the above with the corresponding table in the previous year it is observed that in England and Wales the admission rate shows a decrease of 67·2 per 1,000, the death rate one of ·36, and the constantly sick rate one of 3·96 per 1,000. The average sick time to each soldier was shorter by 1·40 days, but the average duration of each case of sickness was longer by ·13 of a day. Compared with average ratios for the preceding 10 years there was a decrease of 129·8 per 1,000 in the admission rate, and of 1·44 and 5·81 respectively in the ratios of deaths and constantly sick. The average sick time to

United Kingdom.

each soldier showed a decrease of 2·08, and the average duration of each case of sickness an increase of 1·05 days.

In Scotland the admission and constantly sick ratios show decrease of 37·0 and 2·54 per 1,000 respectively as compared with the corresponding ratios in 1895, but the ratio of mortality has increased by 1·19. The average sick time to each soldier and the average duration of each case of sickness were shorter by ·91 and ·54 of a day respectively. Compared with average ratios for the previous ten years, the ratios of admission, mortality, and constantly sick have declined by 94·1 in the case of admission, by 1·14 in mortality, and by 5·23 in constantly sick. The average sick time to each soldier has also decreased by 1·89 days, and the average duration of each case of sickness by ·61 of a day.

In Ireland the ratio of admission exceeded that of the preceding year by 31·4 per 1,000, but the ratios of mortality and constantly sick have decreased by 2·14 and 1·15 respectively. The average sick time to each soldier was shorter by ·39 of a day, while the average duration of each case of sickness was longer by ·43 of a day. Compared with the ten years' average the admission rate in Ireland shows an increase of 56·0, but the rates of mortality and constantly sick have decreased, the former by 1·31 and the latter by 2·14 per 1,000. The average sick time to each soldier decreased by ·75, and the average duration of each case of sickness increased by ·64 of a day.

The United Kingdom as a whole shows a decline of 57·7 in the ratio of admissions, the death rate being also lower by ·74 and that of constantly sick by 3·24 per 1,000. The average sick time to each soldier is less by 1·14 days, but a fractional increase has taken place in the average duration of each case of sickness. Compared with similar average ratios for the preceding ten years, a decrease of 109·9 has occurred in the rate of admission, one of 1·40 in that of mortality, and of 4·82 in the ratio of constant inefficiency through sickness. The average sick time to each soldier is less by 1·72 days, but the average duration of each case of sickness is longer by ·90 of a day.

The total loss to the service by death and discharge by invaliding on account of medical unfitness during the year was 2,540 men, equal to a ratio of 24·78 per 1,000 of the strength, which is above that of the previous year by 3·89.

The more important statistics of sickness, mortality, and invaliding, according to the different groups and orders of diseases, are given for the whole of the troops in the United Kingdom in Abstract I., and for the troops quartered in the three great divisions of the kingdom, England and Wales, Scotland, and Ireland, in Abstracts A., B., and C.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—There were 905 admissions for *eruptive fevers* with 7 deaths, the ratios per 1,000 of the strength being 9·1 and ·07 respectively, as compared with 11·2 and ·08 in the previous year, and 8·4 and ·05 for the preceding ten years.

There was only one admission for *small-pox* during the year as compared with 3 in the previous year, and with 6, the average number of cases for the preceding 10 years. The case occurred at Woolwich in the person of a recruit, who developed the disease a few days after his arrival at the station. *Scarlet fever* was the cause of 374 admissions and 7 deaths, equal to ratios of 3·7 and ·07 per 1,000, compared with 5·3 and ·06 in the previous year, and 3·1 and ·04 per 1,000, the average for the preceding 10 years. Of the total number, 308 occurred in England and Wales, 23 in Scotland, and 43 in Ireland. Every district contributed more or less to this number, the Eastern, Home, and Woolwich districts furnishing 84, 61, and 54 cases respectively, while the South-Eastern, Curragh, North-Western, Belfast, and Channel Islands districts gave the low figures of 8, 8, 7, 3, and 2. The greatest number of cases occurring at any one station was 54 (with 1 death) at Woolwich, the next being 49 (with 1 death) at Warley. The disease was epidemic among the civil population at Woolwich during the greater part of the year. At Warley it is remarked that the cases were mostly of a mild type, and probably imported from the east end of London. Other stations giving high figures were Aldershot 34 cases, London 31 with 1 death, Caterham 24 with 1 death, Colchester 24, Glasgow 18, Chatham 16, Dublin 15, the Curragh 8 with 1 death, and Hilsea 7 with 1 death.

United Kingdom.

Measles caused 184 admissions without any mortality. In 1895 the admissions were 186 with 2 deaths. The admission ratio was almost the same as in the foregoing year, 1·8 per 1,000, and ·2 above the average rate of the preceding ten years.

The admissions in England and Wales numbered 159, in Scotland 8, and in Ireland 17, compared with 151, 3, and 32 in the previous year.

For other eruptive fevers, including cow-pox and chicken-pox, there were 346 admissions.

Enteric Fever.—The admissions for this disease numbered 94 with 22 deaths; the corresponding numbers in the previous year being 137 with 35 deaths. The admission rate, ·9 per 1,000, shows a decrease of ·5, and the death rate ·21 per 1,000, a decrease of ·13, as compared with the corresponding ratios in 1895. In comparison with the ten years' average rates, the admission rate is less by ·4, and that of mortality by ·06 per 1,000. The percentage of mortality to attacks was 23·4, as compared with 25·5 in the previous year and 20·9 for the decennial period. The number of admissions in England and Wales was 45 with 8 deaths, giving ratios of ·7 and ·11 respectively, which are below those of the foregoing year by ·3 and ·18 per 1,000. In Scotland there were only two admissions, but both proved fatal, the admission and death ratios being ·6 and ·57 per 1,000 respectively, as compared with ·9 and *nil* in the previous year. In Ireland there were 47 admissions with 12 deaths, equal to ratios of 2·0 and ·48, a decrease of ·6 and ·03 in comparison with similar rates in the previous year.

The Channel Islands alone were entirely free from the disease, but in the North-Eastern, South-Eastern, Home, and Woolwich districts only single cases occurred. As in previous years, the disease has been most prevalent in the Dublin district, where there were 26 admissions. The cases were distributed amongst 29 stations throughout the kingdom, Dublin, as a station, giving the high number of 24 admissions and 6 deaths, as compared with 38 and 7 in the preceding year. Of these 24 cases 7 occurred in Richmond Barracks, 5 at Island Bridge Barracks, 3 each at Wellington and Royal Barracks, 2 at Marlborough Barracks, and one each at Portobello, Royal Infirmary, Royal Hospital, and in lodgings. The origin of the cases at Richmond Barracks was not definitely traced, but the dry earth latrine system has been assigned as a cause, as was also the canal water which was laid on to the barracks for ablutionary and flushing purposes. A tap supplying this was placed in the guard room, and is said to have been used by some of the men for drinking purposes. It was found on analysis to be impure, and the supply was cut off altogether. A similar course was pursued at Island Bridge Barracks, where the canal water was used for watering horses, the men sometimes drinking the water from the taps which supplied the troughs. The Vartry water has since been used in both these barracks for all purposes. The Island Bridge Barracks were vacated in March. No cause could be assigned for the cases at Wellington, Royal, or Marlborough Barracks. Of the other admissions, insanitary lodgings in town, attendance on cases of the disease and drinking Liffey water are assigned as causes. At Aldershot there were 12 admissions and 2 deaths, as compared with 14 and 5 in the previous year. In six of the cases the disease was apparently contracted out of the district; the remaining six are believed to have had their origin in Aldershot. The detection of the characteristic bacillus in the milk consumed by one of the patients pointed to the milk supply as a possible cause, and there was a suspicion that the water supply to many of the dairies around Aldershot was more or less liable to contamination. Constant attention was devoted to the condition of these dairies, and the sale of milk from suspected dairies to the troops prohibited. At Pembroke Dock there was a well-marked outbreak of enteric fever, accounting for 8 admissions and 1 death amongst the troops, all said to have originated from infection communicated through defective drains and water pipes. The disease was introduced into the station by a seaman from H.M.S. "Terpsichore," who was treated in the infectious diseases block, a small detached building in the highest portion of the grounds of the station hospital, from the 19th July onwards. In this block there is a water-closet, sink and bath, all ultimately emptying into a common drain,

United Kingdom.

beneath which a lead pipe supplying the drinking water was laid. Seventeen days after the admission of the seaman, a female servant of the medical officer was attacked, and three days later (August 7th) the child of a staff sergeant of the Medical Staff Corps, who resided in the hospital, and the child of a civilian, who used water from the hospital tap, were also attacked. On the 10th August three children of a barrack sergeant, and on the next day a private of the Devonshire Regiment, who had been discharged from hospital on July 31st, were found to be suffering from enteric fever. Five days later the child of the medical officer, and on the 19th August a private of the Devonshire Regiment, who had been discharged from hospital on the 12th August, were attacked. Other cases followed, all among persons who obtained their water from the hospital tap, and this source of supply was eventually cut off on the 26th August. The ground was opened up, and it was found that the drain from the infectious diseases block was defective and leaky, and that the water supply pipe, which passed beneath it, was corroded in a most remarkable manner for some six feet of its length, the corrosion commencing just where the water from the bath, in which the foul linen of the first patient had been soaked, ran into the soil in which the lead pipe lay. Almost every person attacked had taken water from the hospital tap, which was supplied by the faulty pipe, and the last case occurred 21 days after the use of this water was discontinued. In all there were 20 cases and 2 deaths among soldiers and others, including a nursing sister who probably contracted the disease while in attendance upon the sick. The outbreak was instructive and typical of the manner in which a localized outbreak of enteric fever occurs and can be accounted for. The water supply and drainage of the infectious diseases ward and hospital have since been reconstructed. At the Curragh there were six cases with one death; in one case the origin was traced to a village in the vicinity; all the remainder were believed to have been contracted away from the camp. There were 5 admissions for the disease at Portsmouth. Two of the men were in the habit of visiting a private house at Portsea, and it was suspected that the disease originated there. One man was supposed to have contracted the disease while on furlough at Basingstoke, but in the other two cases no cause could be assigned. At Shoeburyness also there were 5 admissions, but the causes could not be detected, although it is remarked that the disease was very prevalent at Southend and the neighbouring villages at the time these cases occurred. There were 4 admissions at Cork, one of which was supposed to have been contracted at St. Helen's; in the other cases the origin could not be discovered. At Fermoy 3 admissions occurred with 2 deaths; in one case the disease is supposed to have been contracted during the manœuvres at Munster River, but in the other two no cause could be assigned. There were 3 admissions and 1 death at Belfast; in the fatal case, the man had been on the march from Dundalk a few days prior to admission, and was billeted during the journey; another case was that of a recruit of ten days' service, who stated that his brothers were ill with "fever" at the time of his enlistment. Two admissions and 1 death took place at Devonport; one of the cases was landed from a transport from Aden, and the other occurred in Raglan Barracks, which has since been found to have a very defective condition of drains. Two admissions and one death occurred at Golden Hill Fort; the farm from whence the milk supply was obtained was found to be unsatisfactory, and was brought to the notice of the civil sanitary authorities, who took immediate action to remedy the defects, but it was doubtful whether this milk supply had anything to do with the origin of the disease. At Hilsea there were 2 admissions, but no definite cause could be assigned in either case. At Hounslow 1 case occurred, which terminated fatally; the origin of the disease could not be traced. At Piershill there was also one case with a fatal termination. It was stated that the man had been on furlough and developed the disease a few days after his return. In Sligo there was also a single, but fatal case, the cause assigned being an insanitary condition of lodgings in the town. At Limerick there was 1 admission assigned to unknown causes out of barracks, one death also occurring in a man admitted in 1895.

At the following stations, single admissions are also recorded:—Leicester, said to be imported; Weedon, in the person of a recruit who contracted the disease before arrival at the station; Great Yarmouth, in a man

United Kingdom.

living out of barracks; Chatham, no cause assigned; Shorncliffe, in a man who had arrived from Egypt four days prior to admission; Woolwich, in a man who was on short leave from Chatham; Fort George, in a man who was admitted the day after his arrival in the station from Aldershot; Athlone, where a board gave its opinion that the man contracted the disease while on furlough in England; Ballincollig and Kilkenny, source of contagion not detected; Kinsale, contracted at Kilworth Camp from drinking impure water; and at Kilworth Camp, in a man who came from Cork eight days previously. A death is recorded at Paisley, without admission during the year, and there were also two deaths amongst men detached from their corps, namely, at Birkenhead and Hemel Hempstead. A table showing the admissions and deaths in each of the four quarters of the year is subjoined.

Table showing the Stations in the United Kingdom at which the Admissions and Deaths from Enteric Fever took place in each of the Four Quarters of the Year 1896.

District.	Station.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
North-Eastern	Leicester -	—	—	—	—	—	—	1	—	1	—
North-Western	Preston -	—	—	—	—	1	—	1	—	2	—
Eastern -	Weedon	—	—	—	—	1	—	—	—	1	—
	Great Yarmouth.	1	—	—	—	—	—	—	—	1	—
Western -	Devonport -	—	1	1	—	—	—	1	—	2	1
	Pembroke Dock.	—	—	—	—	8	1	—	—	8	1
Southern -	Golden Hill Fort.	—	—	2	—	—	1	—	—	2	1
	Hilsea -	—	—	1	—	—	—	1	—	2	—
	Portsmouth -	—	—	4	—	—	—	1	—	5	—
Thames -	Chatham -	—	—	—	—	—	—	1	—	1	—
	Shoeburyness	1	—	1	—	2	—	1	—	5	—
South-Eastern -	Shorncliffe -	—	—	—	—	—	—	1	—	1	—
Home - -	Hounslow -	1	1	—	—	—	—	—	—	1	1
Woolwich -	Woolwich -	1	—	—	—	—	—	—	—	1	—
Aldershot -	Aldershot -	5	2	1	—	2	—	4	—	12	2
Scottish -	Fort George -	—	—	—	—	—	—	1	—	1	—
	Paisley -	—	—	—	1	—	—	—	—	—	1
	Piershill -	1	1	—	—	—	—	—	—	1	1
Belfast -	Belfast -	—	—	2	1	1	—	—	—	3	1
Dublin -	Athlone -	—	—	—	—	—	—	1	—	1	—
	Dublin -	14	3	4	3	3	—	3	—	24	6
	Sligo - -	—	—	—	—	—	—	1	1	1	1
Cork - -	Ballincollig -	1	—	—	—	—	—	—	—	1	—
	Cork - -	1	—	2	—	—	—	1	—	4	—
	Fermoy -	1	1	—	—	1	—	1	1	3	2
	Kilkenny -	1	—	—	—	—	—	—	—	1	—
	Kilworth Camp	—	—	—	—	1	—	—	—	1	—
	Kinsale -	—	—	—	—	1	—	—	—	1	—
	Limerick -	1	1	—	—	—	—	—	—	1	1
Curragh -	Curragh -	—	—	2	—	1	1	3	—	6	1
	On Furlough	—	1	—	—	—	—	—	1	—	2
	Total -	29	11	20	5	22	3	23	3	94	22

United Kingdom.

Other Continued Fevers were the cause of 293 admissions, the equivalent ratio per 1,000 being 2·9, practically the same as that of the foregoing year, but 1·8 below the decennial average rate. In England and Wales the admission ratio was 2·4 per 1,000, a decline of ·2 as compared with the ratio of the preceding year, and 1·6 below the decennial average. In Scotland the ratio was 5·1, or 2·2 higher than in the previous year, but below the average rate by 1·3. Ireland, with a ratio of 4·3 per 1,000, shows an increase of ·9 as compared with the previous year, but a decrease of 2·3 as compared with the ten years' average. The highest admission rate for any district was, as in the previous year, in the North-Eastern, 8·5 per 1,000, Belfast and the Scottish district coming next with 5·4 and 5·1 respectively. The Thames district and Channel Islands each with a ratio of ·6, the Eastern with ·8, and the Curragh with 1·5 per 1,000, had the lowest admission rates for this class of disease.

There were 46 admissions and 1 death recorded for *dysentery*, as compared with 35 admissions and no death in the preceding year; the admission ratio, ·5 per 1,000, showing an increase of ·1 on that for 1895. Thirty-three of the cases (including the fatal case) occurred in England and Wales, 13 in Ireland, and none in Scotland. The greatest number of admissions shown in any district was 8, namely, in Aldershot, Dublin coming next with 5.

The heading *other diseases* of the first sub-group of general diseases includes such diseases as influenza and diphtheria. 538 admissions and 2 deaths are recorded under the heading, as compared with 3,368 admissions and 19 deaths in the previous year, the admission and death rates being 5·4 and ·02 per 1,000 respectively for the year under review and 33·7 and ·18 for 1895. The high ratios in 1895 were due to the prevalence of influenza during that year, 2,848 admissions being recorded, as compared with 230 in 1896. Diphtheria caused 244 admissions and 1 death, as compared with 445 admissions and 7 deaths in 1895. Nearly three-fourths of the cases, 177 in all, occurred at Aldershot, and were stated to be mostly of a mild type. Antitoxin was used in the more severe cases with beneficial results. As to the probable cause of prevalence of the disease at that station no definite conclusion was arrived at; but it was noted that diphtheria was prevalent also among the civil population in the neighbourhood, and milk was suspected as being the means of propagating and distributing the disease. Belfast contributed most of the other cases with 53 admissions, all of which were treated successfully with antitoxin. No definite cause is assigned, but the insanitary state of some of the dwellings of the civil population, to which the soldiers resorted, the reconstruction of drainage at Victoria Barracks, and dampness of the ground at Willow Bank are referred to as probable causes.

The remaining admissions occurred as follows: 4 in the Southern District, 3 in the Woolwich, 2 in the Western, 2 in the Curragh, 1 in the Cork District, and 2 in Jersey. Both of the cases in the last-named place were of a severe type, and one of them, the only fatal case during the year, died. Both cases were treated with antitoxin. The source of the infection could not be ascertained in either case.

Mumps gave 63 admissions as compared with 72 in the foregoing year.

Malarial Fevers accounted for 806 of the admissions and 2 deaths, the equivalent ratios being 8·1 and ·02 per 1,000, showing an excess as compared with similar ratios for the preceding year, of 2·1 and ·01, and a similar increase as compared with the ratios for the decennial period. The number of admissions in England and Wales was 720, equal to a ratio of 9·9 per 1,000. In Scotland there were 6 admissions, or 1·7 per 1,000, and in Ireland 80 admissions occurred, giving a ratio of 3·4 per 1,000. In comparison with the previous year's ratios England and Wales shows an increase of 3·4, while Scotland and Ireland each shows a decrease of 1·2 and 1·3. On decennial average rates England and Wales show an increase of 2·7, Scotland a decline of 1·2, and Ireland an increase of ·5 per 1,000. Of the 806 cases, 724 were due to ague, 29 to remittent fever, and 53 to malarial cachexia. Both of the deaths were due to remittent fever. The cases, generally speaking, are accounted for by the return of troops from service abroad.

Septic Diseases.—Under this heading 93 admissions and 5 deaths are recorded, giving ratios of ·9 and ·05 respectively, both slightly lower than in 1895, while in comparison with the decennial average the admission rate shows

United Kingdom.

a decrease of 1·1 and the mortality rate a decrease of ·03 per 1,000. Of the total admissions England and Wales furnished 69, together with the 5 deaths, the ratios being ·9 and ·07 per 1,000. Compared with similar ratios for the foregoing year there is a decrease in the admission rate of ·5, and a fractional increase in the deaths. In comparison with the decennial period there is a decrease of 1·2 in the admission rate and of ·02 in the death rate. In Scotland only 2 admissions occurred, and the admission ratio is below that of the previous year and of the decennial period by 67·5 and 2·0 per 1,000 respectively. Ireland with 22 admissions, or a ratio per 1,000 of ·9 is almost the same as in the previous year, but shows a decrease of ·7 as compared with the decennial average rate. Of the deaths 2 were due to erysipelas, 2 to pyæmia, and 1 to septicæmia.

Venereal Diseases.—There were 4,344 admissions recorded for *primary syphilis*, equivalent to a ratio of 43·5 per 1,000. This is higher than the ratio of the previous year by ·5, but lower than the decennial average rate by 20·1 per 1,000. The ratio of constantly sick from primary syphilis was 4·30, which is also a fractional increase on that of the previous year, but a decrease of 1·63 as compared with the average. Taking England and Wales alone the admission and constantly sick rates were 47·4 and 4·71 respectively, showing increase of 2·5 and ·32 on the ratios of the foregoing year, and decrease of 21·5 and 1·76 on the corresponding decennial rates. Scotland with admission and constantly sick rates of 20·4 and 1·65, shows a decrease in comparison with the preceding year's rates of 8·4 and ·78, and of 11·3 and ·93 per 1,000 in comparison with the decennial average rates. The admission ratio in Ireland was 34·9 and that of constantly sick 3·42, showing a decline of 4·3 and ·41 in comparison with the preceding year, and of 18·2 and 1·47 in comparison with the decennial average rates.

Simple Venereal Ulcer caused 1,365 admissions, with a constantly sick number of 111·62, the corresponding ratios per 1,000 being 13·7 and 1·12. In England and Wales the admissions and constantly sick were 963 and 77·43, in Scotland 57 and 3·95, and in Ireland 345 and 30·24. Adding the sickness from this affection to that from primary syphilis the ratios of admission and constantly sick for all classes of *primary venereal sores* in the United Kingdom amount to 57·2 and 5·42 respectively, showing a decline of 6·1 and ·54 in comparison with 1895, and of 17·7 and 2·10 in comparison with the decennial average rates. In England and Wales the admission and constantly sick rates were 60·7 and 5·78, which are lower than those of the preceding year by 6·5 and ·65, and than the decennial average rates by 30·6 and 2·41 per 1,000. In Scotland, with ratios of 36·6 for admission and 2·77 per 1,000 for constantly sick, the decline on the previous year's ratios was 12·6 and ·99, and on the decennial average 17·6 and 1·19 per 1,000. In Ireland the ratios were 49·5 and 4·70, or 3·9 and ·13 below those of the previous year, and 21·6 and 1·45 below the average of the preceding ten years.

Secondary Syphilis.—There were 3,225 admissions and 5 deaths, with 348·93 men constantly ineffective from this cause during the year. The ratios of admission and constantly sick were 32·3 and 3·49, or 2·6 and ·42 below the corresponding ratios in 1895. In comparison with the ratios for the preceding ten years a fractional increase has occurred in the constantly sick rate, but a decrease of 3·7 in the admission rate. England and Wales, with admission and constantly sick ratios of 34·7 and 3·89, show a decrease of 3·7 and ·54, as compared with these ratios in the previous year. A decline of 4·2 has also occurred in the admission rate when compared with the decennial period, but there is a slight increase (·06) in the constantly sick rate. The admission and constantly sick rates in Scotland were 28·0 and 1·83. These rates are in excess of those of the foregoing year by 9·9 and ·44 respectively, but below those of the decennial average by 1·4 and ·27. In Ireland these ratios, for the year under report, were 25·6 and 2·53, less by ·8 and ·16 than those of the previous year, and also lower than the average rates by 3·1 and ·10 per 1,000.

Gonorrhœa, with 6,867 admissions and 501·84 men constantly sick, gave ratios per 1,000 of 68·8 and 5·03. Compared with corresponding ratios for the previous year there is a decrease of 6·8 and ·38 in each comparison. The

United Kingdom.

decrease is still more marked when the ratios are compared with those of the decennial period, the admissions being less by 21·8 per 1,000 and the constantly sick by 1·05. England and Wales contributed 5,148 of the admissions and 375·29 of the men constantly sick, equal to ratios per 1,000 of 70·9 and 5·16 respectively; the decrease observed in comparison with the ratios of 1895 being 10·1 and ·63 and in comparison with the average rates 22·8 and 1·18 per 1,000. In Scotland the admission rate was 64·3 and that of constantly sick 3·73 per 1,000. The former shows an increase over the previous year's ratio of 1·5, but in the latter there is a decrease of ·31. Both rates, however, are less than the decennial average by 9·1 and ·12 respectively. In Ireland the ratios were 63·2 and 4·80, an increase of 2·0 and ·34 respectively on the previous year's rates, but, in comparison with the decennial average, a decrease of 21·1 and ·84 per 1,000.

Taking *all forms of venereal disease* together, the admissions in the United Kingdom numbered 15,801 and the constantly sick 1391·35. The total ratio of admission for venereal diseases, therefore, was 158·3, and the constantly sick ratio 13·94 per 1,000. Both ratios are lower than the corresponding rates in the previous year by 15·5 and 1·34, and than those of the decennial average by 53·2 and 3·13 per 1,000. The ratios for England and Wales alone were 166·3 and 14·83 per 1,000, or 20·3 and 1·82 below those of the previous year, and 57·6 and 3·53 less than the average rates. In Scotland the ratios were 128·9 and 8·33, being 1·2 and ·86 below those of 1895, and 28·1 and 1·58 below the average of the preceding decennial period. Ireland, with ratios of 138·3 and 12·03, showed a decline of 2·7 in the ratio of admission, and a fractional increase (·05) in that of constantly sick; but, in comparison with the average rates, a decrease is observed in both ratios to the extent of 45·8 and 2·39 per 1,000.

The districts showing the highest ratios of admission for venereal diseases were the Western, Dublin, and North-Eastern, with 239·6, 203·6, and 186·7 per 1,000. The lowest were the Cork, North-Western, and Scottish districts, with 95·3, 126·6, and 128·9 respectively. Compared with the distribution of venereal disease in the previous year, increase is observed in the admission rates of the Western, Dublin, South-Eastern, and Curragh districts of 12·1, 11·2, 7·4, and 7·2 respectively, but in the other districts decrease is observed, the most marked being a decrease of 98·8 in the Channel Islands, 53·5 in the Home, 51·4 in the Woolwich, and 42·9 in the Southern Districts.

Parasitic Diseases were represented by 20 cases, the greater number being admissions for tænia solium. In 1895 there were 27 admissions under this heading.

In the next sub-group of diseases, 147 admissions and 5 deaths are recorded as due to *alcoholism*, 9 of the admissions and 1 of the deaths being due to delirium tremens. There were also 6 admissions for *scurvy*.

Debility and *malformations* caused 737 admissions, as compared with 667 in the foregoing year; the ratio per 1,000, 7·4, showing an increase of ·7 on that of the previous year.

Rheumatism.—Under this head 2,901 admissions and 5 deaths were recorded, giving ratios per 1,000 of 29·1 and ·05 respectively. Compared with the previous year this represents an increase of ·7 in the admission rate, but no change in the mortality rate. Compared with the average rates, the admisson rate shows a decrease of 6·6. The mortality rate remains unchanged. For England and Wales the ratios of admissions and deaths were 30·4 and ·04 respectively, or ·6 in excess of the admission rate, and ·01 below the death-rate, of the previous year. In comparison with the decennial ratios there is a decrease of 7·3 in the admission rate and of ·02 in the death rate. Scotland, with an admission rate of 24·6, is ·2 below the previous year's rate, and 1·9 below the average. Ireland, with admission and death ratios of 25·5 and ·08, shows an increase over the previous year's ratios of ·6 and ·04 respectively. A decline of 5·6 is observed in the admission rate when compared with the decennial period, but the mortality rate shows an increase of ·05. 254 of the total admisions under this heading and all the deaths were returned as rheumatic fever.

Tubercular Diseases, with 264 admissions and 62 deaths, gave ratios of 2·6 and ·61 per 1,000 respectively, the former being lower by ·4 and the latter by

United Kingdom.

·06 than the corresponding ratios in the year preceding, and by ·8 and ·29 respectively as compared with the ratios of the decennial period. In England and Wales the ratios of admissions and deaths were 2·6 and ·59 respectively, which, compared with preceding year, show decrease of ·5 and ·04, and, compared with the decennial rate, of ·9 and ·32 per 1,000. Scotland, with ratios of 2·3 and ·85, shows no change in the admission rate, compared with 1895, but an increase of ·85 in the death rate, there being no deaths in that year. Compared with the average rates the admissions show a decline of ·8 per 1,000, while the death rate is practically the same, the difference being only ·01. In Ireland the admission ratio, 3·0, also remains unchanged as compared with the previous year, but shows a decline of ·3 as compared with the average; the mortality rate, ·60, shows decrease in both these comparisons, of ·31 in the former and ·28 per 1,000 in the latter. Tubercle of lung furnished 254 out of the total number of admissions, and 58 of the recorded deaths in the United Kingdom.

Other diseases of the group to which rheumatism and tubercular diseases belong were answerable for 433 admissions and 18 deaths, being in the ratios of 4·3 and ·18 per 1,000. The former has declined slightly, but the latter shows an advance of ·10 as compared with corresponding ratios for the previous year. Among the admissions were 252 cases of non-malignant growth, 115 of anæmia, 16 of malignant new growth, 9 of purpura, and 6 of diabetes. Of the deaths 12 were caused by malignant new growth, 3 by diabetes, and one each by non-malignant growth, purpura, and leucocythæmia.

LOCAL DISEASES.—*Diseases of the Nervous System* were the cause of 765 admissions and 22 deaths, the corresponding ratios per 1,000 being 7·7 and ·22, a decrease of ·4 and ·17 on those of the previous year, and of 1·1 and ·12 respectively on those of the decennial period. For England and Wales the ratios of admissions and deaths were 7·9 and ·23, showing decrease on those of the foregoing year and on the average for the preceding ten years of ·2 and ·18 in the former, and ·9 and ·13 in the latter comparison. The rates for Scotland were 4·9 for admissions and *nil* for deaths, the decrease being 4·0 and ·28 as compared with 1895, and 3·6 and ·38 as compared with the decennial average. For Ireland the ratios were 7·5 and ·20, showing a decline of ·5 and ·8 respectively in the admission rate, and of ·16 and ·10 in the mortality rates as compared with the previous year and decennial period.

In the number of admissions quoted above are included 119 cases of *mental disease*, giving a ratio of 1·2, as compared with 1·3 and 1·4 for the previous year and the decennial average. England and Wales gave an admission ratio of 1·3 for mental disease, which is the same as that of the previous year, but is an increase of ·1 as compared with the average rate. In Scotland the ratio of admission was ·6, or ·8 below the preceding year's rate, and 1·3 below the average. Ireland, with a ratio of 1·0, also shows a decrease as compared with the ratios for 1895 and for the preceding ten years to the extent of ·5 and ·7 respectively. Excluding these cases of mental disease, the principal admissions were—neuralgia, 372 cases; epilepsy, 118; paralysis, 52; inflammation of the brain and its membranes, 31; and apoplexy, 3 cases. The deaths were recorded under inflammation of the brain and its membranes, 5 cases; abscess of brain, 3 cases; apoplexy, 3; congestion of brain, epilepsy, paraplegia and mania, 2 cases each, and cerebral hæmorrhage, hemiplegia, and tetanus, 1 case each.

Diseases of the Eye were the cause of 1,057 admissions, the equivalent ratio per 1,000 being 10·6, practically the same as that in the previous year, but a decrease of 1·1 in comparison with the average. England and Wales gave a ratio of 10·3, the same as in the previous year, but 1·4 below the average rate. In Scotland the rate, 9·6, shows ·8 of a decrease on the previous year, and an increase of ·1 on the average. The ratio for Ireland, 11·6, shows a decrease of ·4 in comparison with the foregoing year and of ·5 in comparison with the average rate. Conjunctivitis caused 631, keratitis and ulcer of cornea 86, iritis 70, and various other affections 270 of the admissions.

Diseases of other Organs of Special Sense were represented by 818 admissions, giving a ratio of 8·2 per 1,000, which shows an increase of ·5 both on the previous year's and the average rates. England, with an admission ratio of 8·2, shows a fractional increase in both comparisons. Scotland, with a ratio of 4·5, shows a decrease of 1·3 in comparison with the previous year, and of 1·0 in comparison with the average rate. The general increase, therefore, is due to Ireland, which, with a ratio of 8·7, exceeds the previous year's ratio by 1·4, and the decennial average by 2·0 per 1,000. Of the admissions, 500 are shown under inflammation of the external meatus of the ear, and 171 as perforation and inflammation of the membrana tympani. One death occurred from suppurative inflammation of the mastoid cells.

United Kingdom.

Diseases of the Circulatory System were the cause of 1,159 admissions and 36 deaths, the equivalent ratios being 11·6 and ·35 per 1,000. The former exceeds the corresponding ratio of the previous year by 1·6 and that of the decennial period by 2·0 per 1,000; the latter shows a fractional increase compared with the previous year and a fractional decrease compared with the average. In England the admission and mortality rates were 10·7 and ·32 per 1,000, and, compared with those of the preceding year, showed increase of 1·5 and ·09 respectively. Compared with the decennial rates the admissions also showed an excess of ·8, but the death rate a decline of ·08. Scotland, with admission and death rates of 4·8 and ·85, when compared with previous year's and preceding ten years' ratios, shows a decrease in the admission rates of ·7 and 4·1 respectively for the two comparisons, but an increase of ·02 on the previous year and of ·41 on the average rate in the mortality ratio. The admission and mortality ratios for Ireland were 15·5 and ·36, showing increase of 2·5 and ·08 on 1895 and of 6·5 and ·02 on the decennial average. The chief causes of admission were: palpitation 495 cases, valvular disease of heart 356, varicose veins 227, and aneurysm 15. The causes of death were: valvular disease of heart 16 deaths, aneurysm 10, fatty degeneration of heart 4, pericarditis 2, syncope 2, and 1 death each from rupture of heart and rupture of artery.

Diseases of the Respiratory System.—The admissions were 3,876 in number, and the deaths 69, giving ratios of 38·8 and ·67 per 1,000, and showing decrease on the previous year's rates of 20·4 and ·30, and on those of the decennial average of 25·3 and ·60.

England and Wales gave an admission rate of 39·3, and a mortality rate of ·72 per 1,000, which are lower than the last year's rates by 19·2 and ·19, and than the average rates by 26·4 and ·61 per 1,000. In Scotland these rates were 40·5 and ·57, that of admission being 16·8 lower, while that of mortality was practically the same as in the preceding year. In comparison with the decennial rates, a decrease is observed in both rates to the extent of 16·7 and ·87 per 1,000 respectively. The ratio of admissions in Ireland was 37·0 and that of deaths ·56 per 1,000; showing decrease of 24·7 and ·67 as compared with the ratios for 1895, and of 23·5 and ·54 as compared with the average. Of the total number of admissions, as many as 2,976 were due to bronchial affections. Among the remaining cases there were 433 of pneumonia, 265 of pleurisy, and 62 of laryngitis. The causes of death were pneumonia, 46 deaths; pleurisy, pneumonic phthisis, and bronchitis, 6 deaths each; and one death each from cirrhosis of lung, abscess of lung, hæmorrhage of lung, empyema, and œdema of the glottis.

Diseases of the Digestive System were the cause of 9,398 admissions and 28 deaths, the ratios per 1,000 being 94·2 and ·27. There is a decrease in the admission rate of 9·1, but a slight increase in that of mortality in comparison with the preceding year; but, compared with the decennial rates, decrease is observed in both instances to the extent of 12·1 and ·07. England and Wales contributed 7,031 of the admissions and 17 of the deaths, or ratios of 96·8 and ·23 per 1,000, which are below the ratios of 1895 by 7·8 and ·05 and below those of the decennial average by 14·4 and ·13. Scotland, with ratios per 1,000 of 75·4 for admission and ·28 for mortality, shows a decrease of 15·6 in the admission rate compared with the preceding year, but an increase of ·28 in the mortality rate, no death having occurred in 1895. In comparison with decennial average ratios there is a decrease of 18·3 and ·07 in the admission and death rates respectively. In Ireland the admission rate was 89·0, and the death rate ·40 per 1,000, the admission rate showing a decrease, as compared with previous year's and average rates, to the extent of 12·1 and 5·0 respectively, but an increase in the rate of mortality of ·24 and ·13 per 1,000. Of the cases treated, 6,524 were affections of the mouth and throat, 879 dyspepsia, 429 diarrhœa, and 344 hepatic affections, including 168 cases of jaundice and 9 of abscess of liver. The deaths were: from peritonitis 6,

United Kingdom.

abscess of liver 3, cirrhosis of liver 3, ulceration of stomach 3, hepatitis 2, abscess of sub-peritoneal tissue 2, and one each from gastritis, typhlitis, jaundice, diarrhœa, hypertrophy of liver, stricture of rectum, stricture of intestines, strangulation of intestines, and sloughing sore throat.

Diseases of the Lymphatic and Glandular System.—The admissions under this head numbered 1,253, and there was one death, being at the rate of 12·6 and ·01 per 1,000 respectively. The admission rate is lower than in the previous year by 1·2 and than the decennial average by 4·0. In England and Wales the admission rate, 13·3, showed a decline of 1·8 on that of the previous year and of 4·2 on the average. Scotland, with 9·4 as an admission rate, showed increase of 3·4 and ·6 respectively in each comparison. In Ireland the ratio was 10·8, which is only fractionally less than the rate of the foregoing year, but 4·4 less than the decennial rate. Inflammation and suppuration of glands were the chief causes of admission, and there were 8 cases shown as affections of the spleen and 7 cases of goitre. The death was from lymphadenoma.

Diseases of the Urinary System were the cause of 215 admissions and 9 deaths, the equivalent ratios being 2·1 and ·09 per 1,000. The rate of admission shows practically no change when compared with the previous year's and average rates, but the mortality rate is ·07 less in each comparison. The ratios for England and Wales also show scarcely any change from those of the preceding year, but are ·5 and ·05 less than the average. The admission rate in Scotland was 2·8, exceeding by ·2 the rates both of the previous year and of the decennial period. In Ireland the admission rate was 3·0 and that of mortality ·04 per 1,000, showing increase in the admission rate of ·4 and a decrease in death rate of ·24 as compared with the rates of the foregoing year, and an increase of ·8 and a decrease of ·11 as compared with the average. The majority of the admissions were due to incontinence of urine 102 cases, Bright's disease 33, nephritis 27, and cystitis 26. Of the deaths, 5 were from Bright's disease, 3 from nephritis, and 1 from abscess of kidney.

Diseases of the Generative System.—The admissions were 2,445 in number giving a ratio per 1,000 of 24·5, which is less than the corresponding ratios for the previous year and for the decennial period by 7·7 and 12·4 respectively. In England and Wales the admission ratio was 24·0 per 1,000, or less than in the previous year by 10·3, and than the average by 13·9. Scotland, with a ratio of 24·9, shows decrease of 8·5 in the former, and of 12·0 in the latter comparison. Ireland, with a ratio of 26·1 per 1,000, shows a fractional increase (·3) on the foregoing year, but is 7·8 less than the average rate. Apart from simple venereal ulcer, which has been dealt with under venereal diseases, the chief causes of admission were: orchitis 405 cases, balanitis 396, varicocele 97, and stricture of urethra 74 cases.

Diseases of the Organs of Locomotion.—The admissions numbered 1,159 and there were 2 deaths. The admission ratio, 11·6, stands higher by 2·3 than in the previous year and is 3·8 above the average rate. The ratio of admission in England and Wales was 11·4, which is higher than the rates for the foregoing year and the decennial average by 3·0 and 3·9 respectively. Scotland gave an admission rate of 12·8, or 1·9 above that of the previous year and 4·4 in excess of the decennial average rate. The ratio in Ireland was 12·2, only slightly in excess of the previous year's rate, but 3·7 above that of the average. The principal causes of admission were: synovitis 636 cases, flat foot 110, contraction of tendons 92, ostitis 70, and inflamed bursa 62 cases. The two deaths were returned under caries of bone.

Diseases of the Connective Tissue caused 2,700 admissions, giving a ratio of 27·0 per 1,000, and showing an excess of 2·0 as compared with the ratio for 1895, and of 3·7 in comparison with the average rate. England and Wales gave a ratio of 26·9, or 1·2 and 3·6 respectively above the previous year's and average rates. Scotland, with 23·5, showed a decrease in each comparison of 3·8 and 3·3. Ireland, with an admission ratio of 27·9 exceeded the preceding year's rate by 5·4 and the average rate by 4·9 per 1,000. Of the admissions, 1,543 are recorded as abscess, and 1,156 as inflammation of connective tissue. One death occurred, namely, from abscess.

United Kingdom.

Diseases of the Skin.—6,982 admissions were returned, giving a ratio of 69·9 per 1,000, which is ·4 above the rate in 1895 but less than the decennial average rate by 4·3. England and Wales, with an admission rate of 67·2 shows a decrease of 2·3 and by 8·1 respectively, as compared with the rate of the previous year and with the average rate. The ratio of admission for Scotland was 64·0, showing decrease from the previous year's rate and the decennial average rate of 6·5 and 12·8 respectively. Ireland, with a ratio of 79·2 per 1,000 shows increase in both comparisons to the extent of 9·6 and 8·5 per 1,000. Itch accounted for 1,988 admissions, boils for 1,434, eczema for 903, and ulcer and whitlow for 863 and 783 each.

Poisons.—There were 15 admissions on account of poisons and 6 deaths. Two of the cases were returned as snake bite, 2 were cases of lead poisoning, and one each cases of poisoning by oxalic acid, mercury, caustic potash, tinned fish, quinine, tobacco, carbolic acid, aniline and phosphorus. There were also two cases shown under the head of poisoned wounds.

In the case of poisoning by mercury, (mercurial tremor), and in one of the cases of lead poisoning, the disease was the result of the men's occupations previous to enlistment.

In the other case of lead poisoning the man had been employed in the aërated water factory at his station for upwards of 17 years. No lead is used in the factory, but leaden pipes in the "soda water machine" convey the strong sulphuric acid from its chamber to the carbonic acid air generating drum. These leaden pipes gradually become disintegrated by the action of the acid. The gas which is formed at the beginning of the process is always allowed to escape, and in the absence of any other known cause it was assumed that the constant exposure to these fumes for many years had produced the lead poisoning.

In regard to the case of caustic potash poisoning the man drank the solution in mistake for cold tea.

Three of the 6 deaths were suicidal. They were cases of poisoning by carbolic acid, cyanide of potassium, and sulphuric acid. The other deaths were from quinine poisoning, phosphorus poisoning, and poisoning by dead animal matter. The death from poisoning by dead animal matter was from a post-mortem wound, which a corporal of the Medical Staff Corps sustained by pricking his finger with a needle while serving at a post-mortem examination. He took no notice of it at the time, but had to report sick some four days afterwards, and died three days after admission.

The fatal case of quinine poisoning deserves an extended notice, as death following on that drug is of very rare occurrence.

A young soldier (21 years), in hospital for inflammation of lymphatic glands, was helping the wardmaster to remove some articles of equipment from a cupboard, which on its upper shelf contained a number of bottles of stock mixtures. While so engaged he suddenly seized a bottle containing a concentrated solution of quinine, (5 grains to the drachm), and, before he could be prevented from so doing, drank eight ounces of it, *i.e.*, he swallowed, in solution, 320 grains of quinine theoretically, but not practically, because a certain quantity of the quinine, (exact quantity undetermined), had crystallised out and formed a thin layer in the bottom of the bottle. Within two minutes he complained of feeling "queer," rapidly became helpless, and in some 15 minutes was quite unconscious, face pale and covered with a cold sweat, pupils widely dilated and insensible to light, pulse barely perceptible, and respiration very laboured, being accomplished very slowly and with painful gasps. The intensely laboured respiration did not improve, nor did consciousness return. The patient remained in this condition for a little over two hours, when the lower extremities were on two occasions convulsively twitched and death followed. Within a few minutes of the solution having been taken an emetic was given, and there was no delay in applying other remedies subsequently. At the post-mortem examination the only points noticed were that the blood was everywhere fluid, and of a very dark colour, and the brain intensely congested.

Injuries of all kinds caused 10,526 admissions and 57 deaths, the equivalent ratios being 105·5 and ·55 per 1,000, as compared with 94·0 and ·62 in the previous year and 97·8 and ·69, the average rates for the preceding decennial

United Kingdom.

period. There were 37 admissions and 22 deaths returned as general injuries, compared with 68 admissions and 30 deaths in the previous year. Heat apoplexy and sunstroke caused 22 admissions and multiple injuries 13. The deaths were: 14 from asphyxia by submersion, 5 from multiple injury, 2 from asphyxia by strangulation, and 1 from heat apoplexy. The death from heat apoplexy was that of a sergeant of the 1st Royal Irish Rifles, who marched with his battalion from Arundel to Brighton, a distance of about 16 miles, on a very hot day in June. About 600 yards from the barracks at Brighton he fell out, became unconscious, and died in spite of all treatment.

Local injuries numbered 10,489 admissions and 35 deaths; in the previous year the figures were 9,314 admissions and 34 deaths. The most frequent causes of admission were wounds, sprains, contusions, blisters of feet, and abrasions. The deaths were, 11 from gunshot wound, 8 fracture of skull, 5 cut-throat, 3 contusion of abdomen, 3 fracture of spine, 2 dislocation of spine, and one each from laceration of brain, rupture of spleen, and rupture of urethra.

The cases of suicide were 20 in number compared with 24 in 1895, and 22 the average of the preceding ten years. Seventeen of the suicides took place in England and Wales, the remaining 3 in Scotland. The mode of suicide was gunshot in 8 instances, cut-throat in 5, poison in 3, hanging in 2, drowning and multiple injury accounting for one case each.

In 16 of the cases no motive was given for the act, while depression, ascribed to disease, alcoholism, or monetary difficulties is given as the supposed cause in three of the cases. The courts of inquest gave verdicts of "temporary insanity" in 16 cases, and "suicide" without temporary insanity in 4.

Surgical Operations.—Among the surgical operations performed during the year the following may be mentioned:—Amputation of forearm, necessitated by gunshot wound of the hand, and a case of amputation of leg on account of fracture, successful in both instances. Of amputations of fingers and toes on account of deformity, contractions, or injuries, there were a considerable number, with more or less satisfactory results. Three cases of tracheotomy were reported, two of which had fatal results. There were ten cases of excision of rib on account of pleurisy and empyema, and several cases of incision and drainage for the same conditions. There were four cases of excision of eyeball, one necessitated by wound, one by syphilitic disease, and two by gonorrhœal ophthalmia. There were three cases of ligature of artery on account of wound, and one on account of aneurysm. There were also several cases of excision of tumours, aspiration and evacuation of abscesses, operations for the radical cure of hernia, ligature and excision of veins on account of varix and varicocele; operations for fistula in ano, removal of external piles, &c., &c. There were two cases of laparotomy, one of which terminated fatally, and a case of inguinal colotomy on account of cancer of rectum, which also had a fatal result. The *x* rays were used for the first time, namely, in the extraction of a portion of a needle from the thumb, and gave satisfactory results.

Invaliding.—The number of men discharged the service in the course of the year on account of medical unfitness for further service was 2,173, being in the ratio of 21·20 per 1,000, and exceeding the corresponding ratios of the previous year and the decennial average by 4·63 and 5·30 respectively. In England and Wales 1,547 men were invalided, the ratio, 20·89, being above that of the previous year by 3·77 and the average rate by 4·32. There were 72 men invalided in Scotland, which gave a ratio of 20·40 per 1,000, or 6·19 above the rate in 1895, and 1·90 above the average. Ireland showed 554 men discharged for medical unfitness with a ratio of 22·20, which is in excess of the ratio in 1895 and the average by 6·90 and 8·52 respectively.

The principal causes of invaliding were, as in previous years, diseases of the circulatory system, 511 men being discharged for these diseases during the year. This number gave a ratio per 1,000 of 4·99, and is 1·36 in excess of the rate for the preceding year, and 1·67 above the average. Disorders of the nervous system caused the discharge of 235 men, the rate per 1,000 being 2·29, or ·47 above the previous year's rate, and ·22 in excess of the average. Diseases of the organs of locomotion were the cause of 211 men being invalided, the equivalent ratio, 2·06, being higher than the preceding year's

United Kingdom.

rate and the decennial average rate by ·83 and 1·11 respectively. Tubercular diseases caused the discharge of 167 men. The ratio, 1·63 per 1,000, exceeds the ratio of the previous year by ·07, but is less than the average by ·07. Digestive disorders caused the invaliding of 145 men, or a ratio of 1·41 per 1,000, which exceeds the ratio of the foregoing year by ·17, and that of the preceding ten years by ·46. There were 84 men discharged for diseases of the eye, the rate, ·82 per 1,000, exceeding the rate for 1895 and the decennial average rate by ·12 and ·13 respectively. Diseases of the organs of special sense, excluding those of the eye, are answerable for the discharge of 132 men, giving a ratio of 1·29 as compared with 1·10 in the previous year and a decennial average of ·77. There were 134 men discharged on account of secondary syphilis, the rate per 1,000 being 1·30, or ·26 above the rate in 1895 and ·51 in excess of the average. For debility 114 men were invalided, or 1·11 per 1,000, which exceeds the rate in 1895 by ·28 and the average by ·19 per 1,000. To rheumatism were due 91 cases of discharge, the rate, ·89 per 1,000, being ·35 in excess of that of the foregoing year and ·24 above the average rate. For injuries 91 men were discharged, showing an increased ratio as compared with the previous year of ·17, and of ·14 as compared with the average. The number of men discharged on account of respiratory diseases was 67, or ·65 per 1,000, which is slightly above the previous year's rate, but ·23 below the average rate.

The ratios of invaliding for other diseases, in most cases, show more or less of increase, but do not call for special reference.

The following table has been prepared to show the *influence of age* on sickness, mortality, and invaliding among the troops serving in the United Kingdom during the year:—

Ages.	Average Strength.	Ad-missions.	Deaths.	In-valided.	Ratios per 1,000 of Strength.		
					Ad-missions.	Mor-tality.	In-validing.
Under 20 years - -	27,906	19,432	49	459	696·3	1·75	16·45
From 20 to 25 years -	39,441	34,767	132	1,116	881·5	3·35	28·29
" 25 " 30 " -	17,757	7,223	81	373	406·8	4·56	21·01
" 30 " 35 " -	8,503	1,800	41	111	211·7	4·82	13·05
" 35 " 40 " -	4,371	862	30	77	197·2	6·86	17·62
40 years and upwards -	1,843	311	34	37	168·7	18·45	20·08
Total - -	99,821	64,395	367	2,173	645·1	*3·58	*21·20

* Calculated on strength, including men detached (2,655).

From the above it will be seen that the highest admission rate at any age was among men between 20 and 25 years of age, namely, 881·5 per 1,000, the next highest ratio being 696·3 among men under 20 years of age. The quinquennial periods following the period 20–25 years show a considerable decrease, the number of admissions per 1,000 declining as the age increases.

The mortality rate, on the other hand, follows an opposite course, being lowest among men under 20 years of age, and steadily increasing as years advance. This corresponds with what obtained in the preceding year.

The ratio of invaliding was highest among men between 20 and 25 years of age, but otherwise followed an irregular course, decreasing in the following order:—Among men between 25 and 30, men of 40 years and upwards, between 35 and 40, under 20 years. It was least among men between 30 and 35 years of age. The sequence of these ratios does not correspond with the invaliding ratios according to age in 1895.

United Kingdom.

The following table shows the influence of *length of service* on the various rates :—

Service.	Average Strength.	Ad-missions.	Deaths.	In-valided.	Ratios per 1,000 of Strength.		
					Ad-missions.	Mor-tality.	In-validing.
Under 1 year - -	26,319	22,256	51	487	844·7	1·93	18·48
From 1 to 2 years -	18,038	13,563	44	458	751·9	2·44	25·39
" 2 " 3 " -	11,355	7,675	36	270	675·9	3·17	23·78
" 3 " 4 " -	8,565	4,743	12	205	553·8	1·40	23·93
" 4 " 5 " -	7,717	4,209	16	167	545·4	2·07	21·64
" 5 " 10 " -	15,014	8,534	97	346	568·4	6·46	23·04
10 years and upwards -	12,783	3,415	111	240	267·1	8·68	18·77
Total - -	99,821	64,395	307	2,173	645·1	*3·58	*21·20

* Calculated on strength, including men detached (2,655).

The highest admission rate, it will be noticed, occurred among men having less than one year's service. This is followed by a steady decrease up to the fifth year of service. Then a slight increase is shown in the period 5 to 10 years' service, which is followed by the lowest admission ratio of all, namely, in men with 10 years' service and upwards. This sequence follows that of the preceding year with this exception, that the decrease was continuous in 1895, no increase occurring between 5 and 10 years' service. The mortality rate, on the other hand, was low among men in their first year's service, and highest amongst men having upwards of 10 years' service. This is influenced, of course, by the average ages of the different years of service. The lowest mortality rate of all was, however, among men between 3 and 4 years' service. As in the case of the preceding year, invaliding was highest among men of from 1 to 2 years' service; next among those having 2 to 3, and 3 to 4 years' service. The lowest rate occurred among men with under 1 year's service. The admission ratios, when compared with the corresponding ratios of the previous year, show a decline in all groups of years of service except in the group 5 to 10 years' service. The mortality rates, likewise, show a decrease in all but the group 2 to 3 years' service. The invaliding ratios show an increase in every period.

The admissions, deaths, invalids discharged the service, average number constantly sick, average sick time to each soldier, and average duration of each case of sickness in the various military districts are shown in the following table :—

United Kingdom.

Military Districts.	Average Annual Strength.	Admissions into Hospital.	Deaths.			Invalids discharged the Service.	Average Number Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
			With the Regiment	Absent from the Regiment.	Total.			Admitted into Hospital.	Died.	Invalids discharged the Service.	Constantly Sick.		
												days.	days.
1. North-eastern - -	4,794	2,843	17	—	17	72	157·28	593·0	3·54	15·01	32·80	12·00	20·24
2. North-western - -	4,904	3,208	19	—	19	58	130·41	654·2	3·87	11·83	26·59	9·73	15·29
3. Eastern - - -	4,919	3,895	13	2	15	113	206·99	791·8	3·05	22·97	42·08	15·40	19·45
4. Western - -	7,205	5,188	33	2	35	142	314·42	720·0	4·86	19·71	43·64	15·97	22·18
5. Southern - -	7,982	5,176	46	2	48	175	340·18	648·5	6·01	21·92	42·62	15·60	24·05
6. Thames - - -	4,629	2,506	11	5	16	56	140·48	541·4	3·46	12·10	30·35	11·11	20·51
7. South-eastern - -	7,227	5,003	18	3	21	191	281·19	692·3	2·90	26·43	38·91	14·24	20·57
8. Home - - -	7,200	4,638	21	—	21	237	356·13	644·2	2·92	32·91	49·46	18·10	28·10
9. Woolwich - -	5,025	2,916	19	1	20	91	231·43	580·3	3·98	18·11	46·05	16·85	29·04
10. Aldershot - -	17,076	11,052	46	1	47	368	680·54	647·2	2·76	21·55	39·85	14·59	22·54
11. Channel Isles - -	1,713	935	5	2	7	44	47·98	545·8	4·08	25·68	28·00	10·25	18·78
12. Scottish - -	3,530	1,956	14	1	15	72	84·60	554·1	4·25	20·40	23·97	8·77	15·83
13. Belfast - - -	3,898	2,301	13	2	15	140	135·89	590·3	3·85	35·92	34·86	12·76	21·61
14. Dublin - - -	6,821	5,567	28	2	30	203	345·23	816·2	4·40	29·76	50·60	18·52	22·70
15. Cork - - -	8,343	4,803	32	—	32	155	239·55	575·6	3·83	18·58	28·71	10·51	18·25
16. Curragh - -	4,555	2,408	8	1	9	56	152·68	528·6	1·98	12·29	33·51	12·26	23·20
Total - - -	99,821	64,395	343	24	367	2,173	3,844·93	645·1	*3·58	*21·20	38·52	14·10	21·85
Average of 10 years, 1886 to 1895 - -	995,190	751,361	4,675	382	5,057	16,151	43,129·58	755·0	*4·98	*15·90	43·34	15·82	20·95

* These ratios are calculated on the strength, including men detached.

United Kingdom.

It will be observed that the highest admission rate in any district was 816·2 in Dublin, followed by 791·8 in the Eastern district, and 720·0 in the Western district. The lowest ratio was in the Curragh district, 528·6, the next lowest being 541·4, in the Thames district and 545·8 in the Channel Islands. In 1895 similar results obtained, the Dublin and Eastern districts having the highest ratios and the Curragh district the lowest.

As regards increase or decrease on previous year's ratios, the North-western and Curragh districts alone show increase; while the most marked instances of decrease are observed in the Channel Islands, the Thames district, Woolwich, and Aldershot.

The highest rate of mortality is observed in the Southern district, 6·01, the next in order being the Western and Dublin districts with 4·86 and 4·40 per 1,000 respectively; the lowest death rate was in the Curragh district, 1·98, the next lowest being 2·76 in Aldershot, 2·90 in the South-eastern, and 2·92 in the Home district. In the foregoing year the ratio of mortality stood highest in the Dublin district, and lowest in the North-eastern district. Compared with 1895 increased death rates occurred in the North-eastern, Western, Channel Islands, Thames and Scottish districts, all the remaining districts showing decrease, the most marked being a decrease of 2·79 in the Cork district. With regard to invaliding the highest ratios are given by the Belfast, Home, and Dublin districts with 35·92, 32·91, and 29·76 per 1,000 respectively. The lowest rates were 11·83 in the North-western, 12·10 in the Thames, and 12·29 in the Curragh district. In comparison with similar ratios in the preceding year four districts, namely, the North-eastern, Eastern, Thames, and Curragh show decrease, but there has been increase in all the others. The ratios of constantly sick were highest in the Dublin, Home, Woolwich, and Western districts with 50·60, 49·46, 46·05, and 43·64 respectively, while the lowest ratios were in the Scottish, North-western, Channel Islands, and Cork districts with 23·97, 26·59, 28·00, and 28·71. In comparison with the ratios of the previous year increase has occurred in three of the districts, viz., Eastern, Western, and South-eastern. In all the other districts decrease is observed.

The average sick time to each soldier was highest in the Dublin district with 18·52 days, the Home district, which was highest in the preceding year, following with 18·10. The Woolwich and Western districts come next with 16·85 and 15·97 respectively. The districts showing the lowest sick time were the Scottish, North-western, Channel Islands, and Cork, with 8·77, 9·73, 10·25, and 10·51 days respectively. In the Eastern, Western, and South-eastern districts, increase is observed, but in all others there has been decrease. Woolwich, as in the previous year, gives the highest figures for average duration of cases, namely, 29·04 days, the next highest being 28·10 days in the Home, 24·05 in the Southern, 23·20 in the Curragh, and 22·70 in the Dublin districts. The lowest periods were in the North-western, Scottish, and Cork districts, namely, 15·29, 15·83, and 18·25 days respectively. The variations from the foregoing year were as follows:—Increase in the Belfast, Channel Islands, Woolwich, Home, Eastern, South-eastern, Western, and Dublin districts, to the extent of 2·27, 1·84, 1·81, 1·75, 1·56, 1·21, 1·05, and ·52 respectively; and decrease in the North-eastern, North-western, Aldershot, Thames, Curragh, Scottish, Southern, and Cork districts, from 2·41 in the first down to ·18 in the last-mentioned district.

The following table, compiled from the Returns of Principal Medical Officers, shows the admissions, deaths, number of men invalided, and number

United Kingdom.

constantly sick, for each arm of the service, with the ratios per 1,000 of the strength, and the corresponding ratios for the previous ten years:—

Arms of the Service.	Average Strength.	Admitted into Hospital.	Died.	Discharged as Invalids.	Average Number constantly Sick.	Annual Ratio per 1,000 of Strength.				Average of 10 Years, 1886–95.			
						Admitted.	Died.	Invalided.	Constantly Sick.	Admitted.	Died.	Invalided.	Constantly Sick.
Household Cavalry	1,223	728	—	34	41·22	595·3	—	27·80	33·70	644·8	3·96	19·74	32·73
Cavalry - -	9,970	7,063	26	213	412·02	710·4	2·61	21·36	41·33	816·3	4·42	17·63	46·92
Royal Artillery -	16,975	9,383	81	307	582·30	552·7	4·77	18·08	34·30	701·2	6·01	16·48	42·33
Royal Engineers -	4,470	1,490	20	43	86·22	333·3	4·47	9·62	19·29	513·8	5·59	10·34	29·40
Foot Guards -	5,167	3,154	14	175	278·95	610·4	2·71	33·87	53·99	859·5	4·93	22·23	64·10
Infantry - -	43,943	34,154	137	1,157	2030·41	777·2	3·12	26·33	46·21	845·1	4·33	17·84	48·67
Regimental Depôts	10,923	6,075	55	164	256·77	556·2	5·03	15·01	23·51	657·5	6·81	11·59	27·14
Garrison Staff and Departments.	7,150	2,328	34	80	157·04	325·6	4·75	11·19	21·96	464·4	5·63	9·25	28·02

The highest admission ratio in any arm of the service was 777·2 per 1,000, in the Infantry, the next being 710·4 in the Cavalry, and the lowest was 325·6 in the Garrison Staff and Departments, the next lowest being 333·3 in the Royal Engineers. In the preceding year the highest admission rate was, as in the year under report, in the Infantry, followed by that in the Household Cavalry; the two lowest ratios were in the same arms as in the year under report. Taking the 10 years' average the highest admission rate was in the Foot Guards, and the lowest in the Garrison Staff and Departments.

The greatest mortality rate was in the Regimental Depôts and the next in the Royal Artillery, the ratios being 5·03 and 4·77 per 1,000 respectively; in the previous year the highest ratios were in the Regimental Depôts and Royal Engineers. The lowest rate was in the Cavalry with 2·61, followed by the Foot Guards with 2·71. In the preceding year the Infantry gave the lowest rate of mortality, 3·81, the next lowest being the Cavalry with 4·10.

Invaliding was highest in the Foot Guards, with a ratio of 33·87 per 1,000, the Household Cavalry coming next with a ratio of 27·80. The lowest rate was furnished by the Royal Engineers, 9·62; the next lowest being 11·19 per 1,000, in the Garrison Staff and Departments. This order was reversed in the previous year.

The highest rate of constant inefficiency from sickness was, as in the foregoing year, in the Foot Guards, with 53·99 per 1,000 constantly sick, the next highest being the Infantry with a constantly sick rate of 46·21. The lowest rate occurred in the Engineers, with 19·29, and the next lowest, 21·96, in the Garrison Staff and Departments. The same results obtained in the preceding year.

A decrease in admission and mortality rates has occurred in all arms of the service compared with 1895, and in the constantly sick rate the only increase, a very slight one, is in the Regimental Depôts. The invaliding rate, however, shows increase in every arm with the exception of the Household Cavalry and Engineers. In comparing these ratios with those of the decennial average decrease is noticed in almost every instance in the admission, mortality, and constantly sick rates, but the rate of invaliding shows increase in all arms, with the exception of the Engineers.

In Abstract XXIV. will be found a table showing the more important of the health statistics of individual corps serving in the United Kingdom during the year.

United Kingdom.

The principal statistics of sickness and mortality amongst officers, women and children, according to the several groups and orders of diseases, are shown in Abstract D., compiled from the Annual Returns of Principal Medical Officers of Districts.

OFFICERS.—The average strength is given as 4,031, the number of admissions 1,224, and the number of deaths 17. The ratio of admissions was, therefore, 303·6 and the ratio of mortality 4·22 per 1,000. Both ratios are less than the corresponding ratios in 1895 by 115·6 and ·49 respectively.

General Diseases.—Diseases dependent on Morbid Poisons.—Eighteen admissions are returned for *eruptive fevers*, being in the ratio of 4·5 per 1,000, a fraction less than the previous year's rate. The cases comprised 8 of measles, 7 of scarlet fever, and 3 of chicken-pox. *Enteric fever* was the cause of 10 admissions and 1 death, being in the ratios of 2·5 and ·25 per 1,000, the former fractionally above, and the latter exactly half the corresponding ratio in the previous year. The cases were widely distributed, no two cases being returned for the same station. The stations where the attacks occurred were Brighton, Chatham, Curragh, Tipperary, Belfast, Windsor, Sheerness, Cork, Queenstown, and Dorchester. In five instances the origin of the disease could not be traced; four of the cases were contracted on leave. The Curragh case was that of an officer recently joined from Island Bridge Barracks, Dublin, where enteric fever was prevalent. *Other continued fevers* caused 27 admissions, or 6·7 per 1,000, a ratio identical with the corresponding ratio in the previous year. The cases were all of the type known as simple continued fever, and were distributed over various districts. Of *dysentery* 7 cases are returned, one fatal; the admission rate 1·7 per 1,000, showing an increase of 1·2 as compared with 1895. There were 69 cases of *influenza*, one proving fatal, 4 cases of *mumps*, and one of *whooping cough*.

Malarial Fevers.—59 attacks are shown, the ratio 14·6 per 1,000, being a fraction higher than the corresponding rate in the previous year. 52 of the cases were ague, 4 malarial cachexia, and 3 remittent fever. Under the head of *septic diseases* 4 cases of erysipelas are returned, as compared with one in the preceding year.

In the sub-group of *venereal disease* 15 cases are shown, being in the ratio of 3·7 per 1,000, or 1·0 below the corresponding rate in the preceding year. Of the cases 4 were primary syphilis, 2 secondary syphilis, and the remainder gonorrhœa.

2 admissions are shown under the head of *parasitic diseases*, and 21 under that of *debility*; in the previous year there were none of the former and 26 of the latter.

Rheumatism.—71 cases are returned, being in the ratio of 17·6 per 1,000, which is identical with the corresponding ratio in the previous year. Two of the cases only were shown as rheumatic fever. *Tubercle of lung* caused one fatal attack of illness; there being no other admission under the head of *tubercular diseases*. *Other diseases* of the group to which tubercular diseases belong show three admissions, namely, two for non-malignant new growth, and one for cancer. There were 3 deaths from the latter disease during the year.

Local Diseases.—Diseases of the Nervous System caused 32 admissions, being in the ratio of 8·0 per 1,000, 1·4 below the corresponding rate in the previous year. 23 of the cases were forms of neuralgia. There was only one case of mental disease.

Diseases of the Organs of Special Sense caused a sick rate of 6·2 per 1,000 as compared with 5·0 in the previous year. Of the 25 cases giving this ratio, 18 were ophthalmic affections, principally conjunctivitis, 3 aural affections, and 4 diseases of the nose.

Diseases of the Circulatory System caused only 7 admissions, but two of the cases proved fatal, the admission rate being 1·7, and the death rate ·50 per 1,000. The former is identical with, and the latter slightly below, the corresponding ratio in the previous year. One of the deaths was due to valvular disease, and the other to fatty degeneration of the heart.

United Kingdom.

Diseases of the Respiratory System caused 149 admissions and 2 deaths, the ratios being 37·0 and ·50 per 1,000 respectively. The former is lower by 24·3 and the latter by ·24 than the corresponding ratios in the preceding year. Of the cases 126 were bronchial affections, 9 pneumonia, 5 pleurisy, 5 laryngitis, and 4 asthma. Both the fatal cases were cases of pneumonia.

Diseases of the Digestive System caused 231 attacks of illness and 3 deaths, being in the ratios of 57·3 and ·74 per 1,000 respectively. Compared with corresponding ratios for the previous year a decrease of 5·7 has occurred in the ratio of sickness, while the mortality rate has increased by ·24. The principal causes of sickness under this head were affections of the mouth and throat (108 cases), hepatic affections (35), dyspepsia (24), and diarrhœa (24). The diseases causing death were cirrhosis of liver, abscess of liver, and ulceration of stomach.

Diseases of the Lymphatic and Glandular System caused a sick ratio of 1·7 per 1,000, about half the previous year's rate. *Diseases of the urinary system* were the cause of 23 admissions, most being cases of cystitis and Bright's disease. There were two deaths, one from suppression of urine and the other from Bright's disease.

Diseases of the Generative System caused a sick rate of 4·2 per 1,000, or slightly below the previous year's rate. *Diseases of the organs of locomotion* accounted for 53 admissions, 46 being due to synovitis. The ratio, 13·1 per 1,000, shows an increase of 2·7 over the previous year. *Diseases of the connective tissue* gave 36 admissions, or 8·9 per 1,000, being a decrease of 2·3. The 38 admissions for *skin diseases* give a ratio of 10·2 per 1,000 as compared with 9·4 in 1895.

Poisons.—There was only one admission under this heading, the cause being a poisoned wound inflicted by the weaver fish (*Trachinus draco*).

Injuries were 293 in number, equal to 72·7 per 1,000. This is an increase of 6·2 per 1,000 compared with the corresponding rate in the preceding year. The most common injuries were sprains, contusions, and wounds. Among the more serious injuries were 33 cases of fracture of bones, 8 of concussion of the brain and 7 of dislocation of joints. There was one death, suicidal, under this head, an officer having shot himself while in a state of temporary insanity. No motive for the act could be assigned.

WOMEN.—The average number of women borne on the strength of the Army in the United Kingdom is shown as 11,208. The number of cases of sickness, exclusive of uncomplicated cases of parturition, was 3,493, and the number of deaths 41. The ratio of sickness to strength was 311·6 per 1,000, and the ratio of mortality 3·66. Compared with the returns for the preceding year there is a decline of 49·9 in the sick rate and of 1·70 in the death rate.

General Diseases.—Diseases dependent on Morbid Poisons.—36 cases, equal to a ratio of 3·2 per 1,000, are returned under the head of *eruptive fevers*. This ratio is higher than the previous year's by 1·4. The cases were 21 of measles and 15 of scarlet fever, and were not confined to any definite locality. *Enteric fever* caused 7 admissions, being in the ratio of ·6 per 1,000. In 1895 this ratio was 1·0 per 1,000. 2 of the cases occurred at Shoeburyness where enteric fever was prevalent at the time amongst the civil inhabitants, 2 at Norwich, of which one was an imported case; 1 at Buttevant, imported from Sheffield; 1 at Gosport, and 1 in the Island Bridge Barracks, Dublin. *Other continued fevers* caused 23 attacks of sickness, equal to 2·1 per 1,000, an increase of 1·0 per 1,000 over the previous year's rate. All were of the simple continued fever type. There were 8 attacks of *dysentery*, the sick rate, ·7 per 1,000, showing an increase of ·3.

Other diseases of this group gave 82 admissions, including 68 cases of influenza, 9 of diphtheria (5 of which occurred at Aldershot), and 5 of mumps.

Malarial Fevers.—55 cases occurred with one death, being in the ratios of 4·9 and ·09 per 1,000 respectively. The sick ratio is ·7 higher than in the previous year. The cases comprised 50 of ague, 3 of malarial cachexia,

United Kingdom.

and 2 of remittent fever. The death under this head was due to malarial cachexia.

Septic Diseases.—24 attacks of illness and 4 deaths are recorded, being in the ratios of 2·1 and ·36 per 1,000 of the strength respectively. The ratio of sickness is higher than that of the previous year by ·6; the ratio of mortality has not altered. Of the cases 14 were cases of erysipelas, and the remainder cases of septicæmia. All the deaths were due to the latter disease.

Venereal Diseases.—5 cases of secondary syphilis are returned, 2 of which were fatal. The ratio of sickness, ·4 per 1,000, shows a decrease of ·9 as compared with that for 1895.

Four cases are shown under the head of *parasitic diseases,* and one under that of *alcoholism;* in the previous year there were 10 of the former and 4 of the latter.

Under the head of *debility* as many as 725 cases are returned, being in the ratio of 64·7 per 1,000, which is less by 1·7 than the corresponding rate in the previous year. One death also is recorded from debility.

Among the diseases of the last group of general diseases *rheumatism* is shown as the cause of 152 attacks of illness, equal to a ratio of 13·6 per 1,000, or 2·3 lower than in the previous year. The cases included 7 of rheumatic fever, of which one died. *Tubercular diseases* were the cause of 42 attacks of illness and 11 deaths, being in the ratios of 3·7 and ·98 per 1,000, as compared with 4·6 and ·71 per 1,000 in the previous year. All the cases were cases of tubercular disease of the lungs. *Other diseases* of the same group included 97 cases of anæmia, 10 of non-malignant new growth, (1 fatal), and 2 of cancer.

Local Diseases.—Diseases of the Nervous System.—The attacks under this head were 188, with one death, constituting a sick rate of 16·7 and a death rate of ·09 per 1,000, respectively lower than the previous year's ratios by ·3 and ·45. Neuralgia was the principal disease, as many as 130 of the attacks being due to this cause. Hysteria gave 19 admissions, epilepsy 16, paralysis 6, mental diseases 5, and other nervous disorders 12. The fatal case is recorded as inflammation of the membranes of the brain.

Diseases of the Eye gave a sick ratio of 3·4 per 1,000. The cases numbered 38, of which two-thirds were cases of conjunctivitis. *Diseases of other organs of special sense* gave only 10 admissions, 8 of which were aural affections, and 2 diseases of the nose.

Diseases of the Circulatory System accounted for 76 cases of sickness and 4 deaths, the ratios being 6·8 and ·36 per 1,000 respectively. The former shows a decrease of 1·4, and the latter a decrease of ·26 as compared with the previous year. The principal causes of sickness were valvular disease of the heart, 26 cases; varicose veins, 22; palpitation, 11; and phlebitis, 9. Two of the four deaths were due to valvular disease of the heart, the other diseases causing death under this head being pericarditis and phlebitis.

Diseases of the Respiratory System.—The attacks of illness numbered 433, and the deaths 5. The sick rate was 38·6 per 1,000, which is below that of the previous year by 13·5; the mortality rate was ·45, a decline of ·53. As in the preceding year, nearly five-sixths of the total admissions were due to bronchitis, and, among the remaining cases, pleurisy (29), pneumonia (22), asthma (16) and pneumonic phthisis (8) gave the greatest number of admissions. The deaths were 3 from pneumonic phthisis and 2 from pneumonia.

Diseases of the Digestive System caused 749 cases of illness and 4 deaths, being in the ratios of 66·8 and ·36 per 1,000 respectively, both lower than the corresponding rates in the preceding year, the former by 2·3, and the latter by ·26. The sickness from these diseases was chiefly due to affections of the mouth and throat, 268 cases; dyspepsia, 253; and diarrhœa, 53 cases. There were 33 cases of hepatic disease, and 18 of peritonitis. The deaths were 3 from peritonitis and one from abscess of the liver.

Diseases of the Lymphatic and Glandular System gave a sick rate of 1·3 per 1,000, the same as in 1895.

United Kingdom.

Diseases of the Urinary System caused 21 admissions, the ratio, 1·9 per 1,000, being an increase of 1·1 on the previous year's rate. The chief causes of sickness were cystitis, Bright's disease, and nephritis. There was one death, namely, from nephritis.

Diseases of the Generative System accounted for 428 of the cases of illness, and 4 deaths, the ratios being 38·2 and ·36 per 1,000 respectively. The corresponding ratios in 1895 were 38·9 and ·45 per 1,000; 156 of the cases were dependent on affections connected with pregnancy, 17 on diseases connected with parturition, 114 were cases of functional disorders, 63 were uterine disorders, 14 ovarian, and 57 affections of the breast. The causes of the deaths were post-partum hæmorrhage, 2; abscess of breast, and sudden death after delivery, one death each.

Diseases of the Organs of Locomotion gave a ratio of sickness of 2·5 per 1,000, *diseases of the connective tissue* one of 7·3 per 1,000, and *diseases of the skin* one of 7·8 per 1,000; the first two ratios being above and the last below the corresponding ratios in the previous year. Under the head of *poisons* a fatal case of alcoholic poisoning occurred.

Injuries.—61 are recorded, being in the ratio of 5·4 per 1,000 as compared with 5·0 in the preceding year. The injuries were sprains 21 cases, wounds 14, contusions 10, burns and scalds 8, fractures 6, concussion of brain and dislocation, one case each.

CHILDREN.—The average number of children borne on the strength of the army in the United Kingdom was 21,905. The attacks of illness numbered 11,332, and the deaths 363, giving a sick rate of 517·4, and a death rate of 16·57 per 1,000. Compared with the corresponding ratios in the previous year a decrease of 6·3 has occurred in the rate of sickness, and one of 4·72 in the death rate.

General Diseases.—Diseases dependent on Morbid Poisons.—There were 2,436 cases of illness and 26 deaths under the head of *eruptive fevers*, the ratios of sickness and mortality being 111·2 and 1·19 per 1,000 respectively. The former is 20·0 higher, and the latter 1·03 lower than the corresponding rates in the preceding year. Measles accounted for 1,779 of the cases, or 310 more than in 1895. The number of deaths was, however, only 19 as compared with 37. Scarlet fever attacked 240 children, and there were 7 deaths. In 1895 there were 211 attacks with 11 deaths. Other cases of eruptive fevers were 399 of chicken-pox, and 18 of cow-pox. *Enteric fever* caused 18 admissions and 3 deaths, as compared with 31 admissions and 2 deaths in the preceding year. The cases occurred as follows:—5 at Shoeburyness, all said to have been contracted by the children playing on the sands in close proximity to the outlet of an infected village sewer; 3 in Dublin, two attributed to the milk supply, and the third said to have been contracted elsewhere; 2 at Seaforth, the milk supply being the suspected cause; 2 at Navan, 1 contracted in insanitary lodgings, the other from an unknown source; 2 at Pembroke Dock, one due to contaminated water supply, the origin of the other not stated; and single cases at Gosport (defective drainage), Devonport (origin doubtful, but probably defective drainage), Fort George (due to eating shell fish picked up near main sewer), and Netley (origin unknown). Of the three fatal cases, 2 occurred in Dublin, and the third at Shoeburyness. *Simple continued fever* caused 161 attacks of illness, equal to 7·4 per 1,000, which is practically the same as the corresponding rate for the previous year. *Dysentery* caused 12 admissions as compared with 9 in 1895. There were 116 cases of *diphtheria* with 19 deaths, as compared with 89 cases and 19 deaths in 1895. The greatest number of cases at any one station was 55 at Aldershot, where also 7 deaths occurred. There were 426 cases of whooping cough, as compared with 378 in the previous year; 10 were fatal. 187 cases of mumps, and 38 of influenza are also recorded in this sub-group. *Malarial fevers.*—55 cases are recorded, equal to 2·5 per 1,000. Three of the cases were remittent fever, one malarial cachexia, which proved fatal, and the remainder ague. *Septic diseases.*—8 cases are recorded, all cases of erysipelas. In 1895 there were two cases, one of which proved fatal.

United Kingdom.

Under the head of *venereal diseases* there were 19 cases of congenital syphilis, 2 of which were fatal. In the previous year there were 25 cases and 6 deaths from this cause.

Parasitic Diseases gave a sick rate of 4·0 per 1,000, intestinal worms being the principal cause of admission.

In the group of *developmental diseases* 508 cases and 44 deaths are recorded, being in the ratios of 23·2 and 2·01 per 1,000, as compared with 24·3 and 2·50 in the previous year. Of the cases treated 475 are returned as debility, 24 as immaturity at birth, and 9 as malformations. The deaths were immaturity at birth 21 cases, debility 20, and malformations 3.

In the fourth group of general diseases there are 57 admissions, or 2·6 per 1,000, on account of *rheumatism*, and 39, or 1·8 per 1,000, on account of *tubercular diseases*. The corresponding ratios in 1895 were 2·0 and 1·9. Fourteen of the cases of rheumatism were returned as rheumatic fever, and 16 of the cases of tubercular affections as tubercle of the lungs. There were one death from rheumatic fever, 5 from tubercle of the lungs and 10 from other tubercular affections. The *other diseases* in the same group included 38 cases of anæmia, 21 of scrofula, and 21 of rickets, with 2 deaths from rickets, one from hæmophilia, and one from non-malignant new growth.

Local Diseases.—Diseases of the Nervous System.—The number of cases was 189, with 58 deaths, the ratios of sickness and mortality being 8·6 and 2·65 per 1,000 respectively, as compared with 9·6 and 3·61 in the previous year. The principal cause of sickness was convulsions, as many as 108 of the cases and 42 of the deaths being returned under that head. Of the remaining cases the more important admissions were neuralgia 29 cases, inflammation of the brain or its membranes 12 cases with 10 deaths, chorea 11 cases, and epilepsy 7 cases with 1 death. There were also 3 deaths from hydrocephalus, and one each from paralysis and laryngismus stridulus. *Diseases of the eye* caused 211 admissions, principally cases of conjunctivitis. *Diseases of other organs of special sense* gave a sick rate of 4·0 per 1,000, dependent on 87 cases, of which 84 were diseases of the ear, and 3 affections of the nose. There was one death returned, due to inflammation of the membrana tympani. *Diseases of the circulatory system* gave only 11 admissions, of which 6 were cases of valvular disease of the heart, a death being also due to this disease. The ratios of sickness and mortality for *diseases of the respiratory system* were 142·7 and 4·97 per 1,000 respectively, as compared with 141·9 and 6·39 in the preceding year. The total number of admissions from these diseases was 3,124, as many as 2,885 being cases of bronchitis. The remaining cases comprised 179 cases of pneumonia, 31 of croup, 14 of laryngitis, 7 of asthma and 8 of pleurisy. The deaths were 109, 72 being due to bronchitis, 30 to pneumonia, 6 to croup and 1 to laryngitis. *Diseases of the digestive system* caused 1,926 attacks and 52 deaths, being in the ratios of 87·9 and 2·37 per 1,000 respectively, the former higher by ·4, and the latter lower by ·45 than the corresponding rates in the previous year. The principal causes of sickness were affections of the mouth and throat 751 cases, diarrhœa, 414, dyspepsia 289, and teething 267 cases. The causes of death were diarrhœa 18, teething 10, enteritis 7, inflammation of stomach 5, peritonitis 5, jaundice 3, inflammation of intestines 2, intussusception 1, and obstruction of intestine one. *Diseases of the lymphatic and glandular systems* caused 101 admissions, all but six being cases of inflammation of glands. The sick rate, 4·6 per 1,000, is slightly above the corresponding rate in 1895.

Urinary Affections caused 13 admissions and 2 deaths, as compared with 10 admissions and no death in the previous year. Nephritis was the cause of nearly half the admissions and of both deaths.

Diseases of the Generative System show 29 cases, chiefly phimosis; and *diseases of the organs of locomotion* 27, chiefly synovitis. In the latter group a death is recorded due to curvature of the spine. *Diseases of the connective tissue* gave a sick rate of 3·5 per 1,000, dependent on 52 cases of inflammation and 134 of abscess; one of the former and two of the latter died.

Diseases of the Skin caused 718 admissions, equal to a ratio of 32·8 per 1,000, or 3·4 less than the corresponding rate in the preceding year, eczema and ringworm being the commonest forms. *United Kingdom.*

Under the head of *poisons* two cases are returned; one a case of poisoning by ammonia, and the other a case of poisoning by cantharides; the former proved fatal.

Injuries were 452 in number, with 10 deaths. In 1895 there were 451 injuries with 7 deaths.

The principal injuries were wounds 190, burns and scalds 78, contusions 75, fractures 48, sprains 39, dislocations 6, and concussion of brain 3. The deaths were 6 from burns and scalds, 2 from fractures, one from contusion, and one from asphyxia caused by overlying.

VACCINATION.

In the accompanying table will be found the conditions as to vaccination of all recruits found on inspection fit for the service, during the year, together with the proportion per 1,000 of each condition :—

1896.	Number of Recruits found on Inspection fit for the Service.	Proportion per 1,000.
Had marks of vaccination - -	30,388	965·9
Had marks of small-pox - -	109	3·4
Had neither marks of vaccination nor of small-pox - - -	966	30·7
Total - -	31,463	1000·0

As compared with the results in the preceding year a decrease of 3·0 per 1,000 is observed among recruits bearing marks of vaccination, a decrease of ·3 among those bearing marks of small-pox, and an increase of 3·3 among those bearing neither marks of vaccination nor of small-pox.

The following tables, compiled from the annual returns of Principal Medical Officers, show the number of vaccinations performed during the year, with the proportions per 1,000 of successful or modified results or of failures, whether vaccinated with fresh or preserved lymph.

United Kingdom.

Results.	Vaccinated during the Year.						Proportion per 1,000.					
	Arm to Arm.		From Preserved Lymph.		Total.		Arm to Arm.		From Preserved Lymph.		Total.	
	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.
TABLE I.—*Recruits.*												
Perfect vaccine pustules - -	—	113	366	16,694	366	16,807	—	724·4	682·9	614·2	682·9	614·8
Modified vaccine pustules - -	—	32	75	6,736	75	6,768	—	205·1	139·9	247·8	139·9	247·6
Failures - - - -	—	11	95	3,751	95	3,762	—	70·5	177·2	138·0	177·2	137·6
Total - - -	—	156	536	27,181	536	27,337	—	1000·0	1000·0	1000·0	1000·0	1000·0
TABLE II.—*Soldiers other than Recruits.*												
Perfect vaccine pustules - -	—	—	2	611	2	611	—	—	46·5	349·3	46·5	349·3
Modified vaccine pustules - -	—	—	8	546	8	546	—	—	186·1	312·2	186·1	312·2
Failures - - - -	—	—	33	592	33	592	—	—	767·4	338·5	767·4	338·5
Total - - -	—	—	43	1,749	43	1,749	—	—	1000·0	1000·0	1000·0	1000·0
TABLE III.—*Soldiers and Recruits.*												
Perfect vaccine pustules - -	—	113	368	17,305	368	17,418	—	724·4	635·6	598·2	635·6	598·8
Modified vaccine pustules - -	—	32	83	7,282	83	7,314	—	205·1	143·3	251·7	143·3	251·5
Failures - - - -	—	11	128	4,343	128	4,354	—	70·5	221·1	150·1	221·1	149·7
Total - - -	—	156	579	28,930	579	29,086	—	1000·0	1000·0	1000·0	1000·0	1000·0

United Kingdom.

The primary vaccinations and re-vaccinations, as shown above, give a total of 29,665 operations amongst all classes of soldiers.

This number is less than the number of vaccinations in the preceding year by 2,519. The number of vaccinations among recruits was 27,873, a decrease of 1,624, and the number among soldiers other than recruits 1,792, a decrease of 895, as compared with the corresponding numbers in the previous year.

The number of recruits found fit for service during the year was 31,876, and as the number vaccinated was 27,873, there are 4,003 not accounted for in the vaccination returns. This is explained by the following facts:—Some recruits, who joined from the militia, had been satisfactorily vaccinated while in that force. Others enlisted so late in the year that the results of their vaccination do not appear until the returns of the following year, and in some instances recruits have deserted before vaccination was carried out.

In the arm-to-arm operations amongst recruits, all of which were re-vaccinations, an increase of 69·9 per 1,000 has taken place in perfect results as compared with the returns of the previous year. This increase has resulted in a decrease of 42·2 in the proportion of modified results, and of 27·7 in the proportion of failures.

With regard to the operations with preserved lymph amongst recruits there is a decrease of 11·8 per 1,000 in the proportion of perfect vesicles in primary vaccinations, and of 6·5 in modified vesicles, with an increase of 18·3 in the proportion of failures. In re-vaccinations a decrease of 6·9 per 1,000 has occurred in the proportion of perfect results, an increase of 18·2 in the proportion of modified vesicles, and a decrease of 11·3 in failures.

In the vaccination of soldiers other than recruits there were no arm-to-arm operations. The operations with preserved lymph are so few in number as regards primary vaccinations that the proportion of failures, &c. is not of much value for purposes of comparison with the previous year. A considerable number of re-vaccinations, however, were performed, the results of which show an increase of 70·7 per 1,000 in the proportion of perfect vaccinations, a decrease of 31·0 in the proportion of modified vesicles, and a decrease of 39·7 in the proportion of failures.

In comparing the results of vaccinations amongst all classes of soldiers, as shown in Table III., with the corresponding results in the previous year, it is found that, as regards primary vaccinations, there was a decrease of 58·6 per 1,000 in the proportion of perfect vesicles, a decrease of 3·5 in the proportion of modified vesicles, and an increase of 62·1 in the proportion of failures, whereas as regards re-vaccinations there was an increase of 6·3 per 1,000 in the proportion of perfect results and of 12·2 in the proportion of modified results, with a decrease of 18·5 in the proportion of failures.

Women.—There were 33 primary vaccinations amongst women, 24 perfect, 8 modified, and one failure. Of 178 cases of re-vaccination 85, or 477·5 per 1,000, gave perfect vaccine vesicles, 40, or 224·7 per 1,000 modified results, and 53, or 297·8 per 1,000 failures. Compared with the previous year there was a decrease of 190·5 per 1,000 in the proportion of perfect results, with an increase of 13·8 per 1,000 in the proportion of modified vesicles, and of 176·7 per 1,000 in the proportion of failures.

Children.—The number of primary vaccinations amongst children was 3,308, of which 17 were arm-to-arm operations, and 3,291 vaccinations with preserved lymph. All the former gave perfect results. The latter, although showing no failures, gave perfect results in 850·2 per 1,000 only, the rest being modified. As compared with the previous year's returns this is a decrease of 40·4 in the proportion of perfect vesicles.

There were no arm-to-arm re-vaccinations amongst children. The number of re-vaccinations with preserved lymph was 195, of which 151, or 774·4 per 1,000 were successful, a decrease of 76·8 as compared with the results of the previous year.

United Kingdom.

ON THE RECRUITING OF THE ARMY.

It is shown by the Annual Returns of Principal Medical Officers that the number of recruits inspected during the year was 54,574. Of these, 23,111 were rejected as unfit, equal to a ratio per 1,000 of 423·48. The remaining 31,463, or 576·52 per 1,000, were found fit for the service.

The subjoined table shows the number inspected, the number rejected, and the ratios of rejections per 1,000 examined:—

TABLE I.

Number of Recruits Inspected.	Number Rejected			Ratio of Rejections per 1,000 inspected		
	On Inspection.	Unfit within Three Months of Enlistment.	Total.	On Inspection.	Unfit within Three Months of Enlistment.	Total.
54,574	22,698	413	23,111	415·92	7·56	423·48

It will be observed that of the total number found unfit, 413 men, after having passed at first, were found to have become unfit, or not likely to become efficient soldiers, within three months of enlistment.

These recruits were forthwith discharged under the provisions of para. 107 M. (*d.*) Section XIX., Queen's Regulations and Orders for the Army, as all recruits pass through a period of probationary training before being finally accepted. Excluding these the number of men rejected on inspection was 22,698, or 415·92 per 1,000.

Compared with the corresponding ratios of the previous year an increase of 11·10 per 1,000 is seen in the ratio of rejection on inspection, and one of ·95 in that of those rejected after three months. The total ratio of rejection has, therefore, increased by 12·05, the ratio of men found fit having decreased by the same amount.

The native countries of recruits, the ratios of rejection, and the proportion per 1,000 furnished by each country are given in the following table:—

TABLE II.

Native Countries of Recruits.	Number Inspected.	Number Rejected.	Ratio Rejected per 1,000 Inspected.	Proportion per 1,000 Recruits furnished by each Country.
England and Wales -	42,698	18,496	433·18	782
Scotland - - -	4,742	1,731	365·04	87
Ireland - - -	6,483	2,633	406·14	119
British Colonies and Foreign Countries -	651	251	385·56	12
Total - -	54,574	23,111	423·48	1,000

United Kingdom.

Compared with similar statistics published in the report for the previous year, the ratio of rejection of recruits born in England and Wales has increased by 12·15, that of recruits born in Ireland by 30·58, and that of those born in the Colonies or Foreign Countries by 44·45, but the ratio of rejection of recruits born in Scotland has decreased by 19·53 per 1,000.

Of every 1,000 recruits inspected 782 were natives of England and Wales, 87 were natives of Scotland, 119 were natives of Ireland, and 12 were born in the Colonies or Foreign Countries. This proportion is practically the same as in the previous year.

In Table III. are shown the occupations of recruits previous to enlistment, the ratio rejected per 1,000 of each group of occupations, and the proportion of each group in every 1,000 men inspected:—

TABLE III.

Occupations of Recruits.	Number Inspected.	Number Rejected.	Ratio Rejected per 1,000 Inspected.	Proportion of each Group in 1,000 Recruits Inspected.
1. Labourers, Servants, Husbandmen, &c.	36,100	15,699	434·88	662
2. Manufacturing Artisans (as Clothworkers, Weavers, Lace Makers, &c.).	6,573	3,037	462·04	120
3. Mechanics employed in Occupations favourable to physical development (as Smiths, Carpenters, Masons, &c.).	5,681	2,163	380·74	104
4. Shopmen and Clerks -	3,998	1,734	433·72	73
5. Professional Occupations, Students, &c.	593	219	369·30	11
6. Boys - - - -	1,629	259	158 99	30
Total - - -	54,574	23,111	423·48	1,000

Compared with the previous year, there is an increase of 18·08 per 1,000 in the ratio of rejections in Class 1 (labourers, &c.) of 15·00 in Class 2 (manufacturing artisans), and of 29 13 in Class 5 (professional occupations); while there is a decrease of 9·33 per 1,000 in Class 3 (mechanics, &c.), of 8 50 in Class 4 (shopmen and clerks), and of ·89 in Class 6 (boys under seventeen years of age).

The proportions of the different classes of occupations among 1,000 recruits inspected compared with those of the preceding year, show a decrease of 17 in the labourer class (Class 1), and of 11 in the artisan class (Class 2), but an increase of 10 in Class 3 (mechanics, &c.), of 16 in Class 4 (shopmen and clerks), and of 1 each in Classes 5 and 6.

The following table gives the number of recruits rejected on inspection during the year according to the different causes of rejection arranged in classes, and the ratio per 1,000 of rejection in each class. Similar information is given regarding recruits unfit within three months of enlistment.

United Kingdom.

TABLE IV.

Causes of Rejections in Classes.	Total Inspected, 54,574.			
	Number Rejected on Inspection.	Ratio per 1,000 Rejected on Inspection.	Unfit within Three Months of Enlistment.	Ratio per 1,000 Rejected as Unfit within Three Months of Enlistment.
1. Syphilis - - - - -	200	3·67	2	·04
2. Scrofula - - - - -	118	2·16	2	·04
3. Tubercle - - - - -	37	·68	5	·09
4. Impaired Constitution and Debility	242	4·44	30	·55
5. Other General Diseases - -	181	3·32	7	·13
6. Diseases of Nervous System -	41	·75	23	·42
7. Weakness of Intellect - -	78	1·43	54	·99
8. Defective Vision - - -	2,222	40·72	5	·09
9. Diseases of Eyes and Eyelids -	64	1·17	3	·05
10. Diseases of Nose and Mouth -	27	·49	—	—
11. Disease of Ears - - -	93	1·71	12	·22
12. Deafness - - - -	81	1·48	11	·20
13. Impediment of Speech - -	68	1·25	—	—
14. Disease of Heart - - -	1,024	18·76	50	·92
15. Disease of Arteries (Aneurysm) -	6	·11	—	—
16. Disease of Veins (Varix) - -	858	15·72	21	·38
17. Disease of Lungs (except Tubercle)	64	1·17	6	·11
18. Loss or Decay of many Teeth -	1,078	19·75	15	·27
19. Hernia - - - - -	367	6·73	37	·68
20. Laxity of Abdominal Rings -	77	1·41	3	·05
21. Hæmorrhoids - - -	67	1·23	—	—
22. Diseases of the Urinary Organs -	24	·43	6	·11
23. Varicocele - - - -	713	13·07	9	·16
24. Other Diseases of the Genital Organs (not Syphilitic).	99	1·81	2	·04
25. Defects of Upper Extremities, from Fracture, Contraction, Luxation, &c.	293	5·37	2	·04
26. Defects of Lower Extremities, from Fracture, Contraction, Luxation, &c.	990	18·14	23	·42
27. Flat Feet - - - -	972	17·81	28	·51
28. Diseases of Joints - - -	86	1·58	20	·37
29. Other Affections of Bones and Muscles.	86	1·58	12	·22
30. Ulcers, Wounds, and Cicatrices -	113	2·07	2	·04
31. Other Affections of the Cutaneous System.	186	3·41	6	·11
32. Malformation of Ears - -	10	·18	—	—
33. Malformation of Nose and Mouth -	3	·05	—	—
34. Malformation of Chest and Spine -	300	5·50	4	·07
35. Malformation of Urinary or Genital Organs.	20	·37	—	—
36. Under Height - - -	1,570	28·77	1	·02
37. Under Chest Measurement - -	7,621	139·64	7	·13
38. Under Weight - - -	1,962	35·95	—	—
39. Apparent Age not in accordance with Regulations.	307	5·63	2	·04
40. Not likely to become efficient -	309	5·66	3	·05
41. Over Height - - -	41	·75	—	—
Total rejected - -	22,698	415·92	413	7·56

United Kingdom.

The largest number of rejections on inspection is caused by defective development, the ratio of rejection under the headings 36, 37, and 38, being 204·36 per 1,000. This is an increase of 12·68 on the corresponding ratio for the previous year. The highest ratio of rejection was on account of chest measurement, namely, 139·64 per 1,000, and this is higher than the similar rate in the previous year by 13·26. The ratio of rejection for being under weight, 35·95 per 1,000, has declined by ·63, while the ratio of rejection for being under height, 28·77 per 1,000, is practically the same as in the preceding year. Among other causes of rejection, defective vision was the most frequent, the ratio being 40·72 per 1,000, which is higher by ·84 than in 1895. The next most frequent causes of rejection were loss or decay of teeth (19·75 per 1,000), diseases of the heart (18·76), defects of lower extremities (18·14), flat feet (17·81), disease of veins (15·72), and varicocele (13·07 per 1,000). These conditions were, generally speaking, the more frequent causes of rejection in previous years also, but the order of their frequency and the ratios themselves vary.

Among the recruits found unfit within three months after enlistment, the highest number of rejections were on account of weakness of intellect (54), cardiac disease (50), hernia (37), and debility (30).

Ages, Heights, Weights, and Chest Measurements of all Recruits finally approved for Service during the Year.

In the following table are shown the ages of all recruits finally approved for service, and the proportion of each age per 10,000:—

TABLE V.

Ages.	Numbers finally approved for Service.	Proportion per 10,000.
Boys under 17 years	1,372	436
From 17 to 18 „	321	102
„ 18 to 19 „	13,420	4,265
„ 19 to 20 „	6,746	2,144
„ 20 to 21 „	3,192	1,015
„ 21 to 22 „	2,340	744
„ 22 to 23 „	1,617	514
„ 23 to 24 „	1,291	410
„ 24 to 25 „	900	286
25 years and upwards	264	84
Total	31,463	10,000

The greatest number of recruits, it will be seen, are passed fit for service between 18 and 19 years of age, the number at that age constituting nearly half of the total. In the preceding year the proportion was 4,189 for every 10,000. Of the ages between 19 and 20 years, and 20 to 21 years, the proportions, 2,144 and 1,015 in every 10,000 approved also resemble very closely the corresponding proportions in 1895, namely, 2,054 and 1,082 respectively.

The next table gives the heights of recruits finally approved, and the proportion of each height per 10,000. It also gives the heights of recruits finally approved, arranged in series according to age, together with the proportion per 10,000 of each height at each age.

United Kingdom.

TABLE VI.

Heights of Recruits finally approved for Service.	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Total at each Height.
ft. in. ft. in. Under 5 3 -	1,178	12	30	9	1	3	3	3	1	4	1,244
5 3 to 5 4 -	77	59	1,188	352	121	63	37	24	15	8	1,944
5 4 to 5 5 -	44	87	3,456	1,330	545	373	215	170	96	34	6,350
5 5 to 5 6 -	36	73	3,505	1,440	615	442	305	202	148	38	6,804
5 6 to 5 7 -	16	45	1,835	1,147	538	402	267	220	160	53	4,683
5 7 to 5 8 -	15	20	1,436	983	491	364	283	244	178	47	4,061
5 8 to 5 9 -	2	13	968	658	364	279	211	181	133	31	2,840
5 9 to 5 10 -	4	8	559	428	275	212	134	118	89	26	1,853
5 10 to 5 11 -	—	2	230	218	124	119	92	61	43	12	901
5 11 to 6 0 -	—	2	132	121	65	50	50	33	21	10	484
6 0 and upwards	—	—	61	60	53	33	20	35	16	1	299
Totals at each age	1,372	321	13,420	6,746	3,192	2,340	1,617	1,291	900	264	31,463

Heights of Recruits finally approved for Service.	Proportions per 10,000 at each Age.										Total Proportion of each Height per 10,000.
	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
ft. in. ft. in. Under 5 3 -	8,586	374	22	13	3	13	19	23	11	152	395
5 3 to 5 4 -	561	1,859	885	522	379	269	229	186	166	303	618
5 4 to 5 5 -	321	2,710	2,575	1,972	1,707	1,594	1,330	1,317	1,067	1,288	2,018
5 5 to 5 6 -	262	2,274	2,612	2,135	1,927	1,889	1,886	1,565	1,644	1,439	2,163
5 6 to 5 7 -	117	1,402	1,367	1,700	1,685	1,718	1,651	1,704	1,778	2,007	1,483
5 7 to 5 8 -	109	623	1,070	1,457	1,538	1,555	1,750	1,890	1,978	1,780	1,291
5 8 to 5 9 -	15	405	721	976	1,140	1,192	1,305	1,402	1,478	1,174	903
5 9 to 5 10 -	29	249	417	635	862	906	829	914	989	985	589
5 10 to 5 11 -	—	62	172	322	389	509	569	472	478	455	286
5 11 to 6 0 -	—	62	99	179	204	214	309	256	233	379	154
6 0 and upwards	—	—	60	89	166	141	123	271	178	38	95
Total -	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

Compared with a similar return for the previous year, the proportion of recruits under 5 feet 3 inches in height per 10,000 approved has increased by 38, between 5 feet 5 inches and 5 feet 6 inches by 47, between 5 feet 7 inches and 5 feet 8 inches by 16, between 5 feet 8 inches and 5 feet 9 inches by 4, between 5 feet 9 inches and 5 feet 10 inches by 9, between 5 feet 11 inches and 6 feet by 2, and over 6 feet by 11; while the proportion of recruits between 5 feet 3 inches and 5 feet 4 inches in height has decreased by 5, between 5 feet 4 inches and 5 feet 5 inches by 2, between 5 feet 6 inches and 5 feet 7 inches by 112, and between 5 feet 10 inches and 5 feet 11 inches by 8.

United Kingdom.

Omitting boys under 17 years of age, the highest proportion of recruits approved were between 17 and 18 years of age and between 5 feet 4 inches and 5 feet 5 inches in height, the actual number being 2,710 in every 10,000. The next highest number was 2,612 in 10,000 between 18 and 19 years of age and between 5 feet 5 inches and 5 feet 6 inches in height. In the preceding year the results were similar. With regard to the heights of recruits between 18 and 19 years, the age at which the greatest proportion of recruits is obtained, 2,612 per 10,000 were between 5 feet 5 inches and 5 feet 6 inches in height, and 2,575 per 10,000 between 5 feet 4 inches and 5 feet 5 inches. This shows a considerable advance in height over the preceding year, when the proportions were only 2,534 per 10,000 between 5 feet 5 inches and 5 feet 6 inches, as compared with 2,646 per 10,000 between 5 feet 4 inches and 5 feet 5 inches.

The next table shows the weights of the recruits who were finally approved, and the proportion of each weight per 10,000. It also shows the weights of these recruits arranged in series according to age, together with the proportion per 10,000 of each weight at each age :—

TABLE VII.

Weights of Recruits finally approved for Service.	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Total at each Weight.
Under 100 lbs. -	1,116	2	—	—	—	—	1	—	—	—	1,119
100—110 lbs. -	177	21	20	12	2	—	2	—	1	2	237
110—120 „ -	57	127	3,739	1,153	236	179	140	89	18	12	5,800
120—130 „ -	16	112	5,552	1,478	971	582	380	241	186	42	9,560
130—140 „ -	6	48	2,860	2,977	998	823	500	392	272	80	8,956
140—150 „ -	—	8	955	789	603	441	342	319	212	53	3,722
150—160 „ -	—	1	230	260	223	209	162	166	123	40	1,423
160—170 „ -	—	2	52	63	87	87	72	61	66	24	514
Upwards of 170 lbs.	—	—	12	5	22	19	18	23	22	11	132
Totals at each age	1,372	321	13,420	6,746	3,192	2,340	1,617	1,291	900	264	31,463

Weights of Recruits finally approved for Service.	Proportions per 10,000 at each Age.										Total Proportion of each Weight per 10,000.
	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
Under 100 lbs. -	8,134	62	—	—	—	—	6	—	—	—	356
100—110 lbs. -	1,290	654	16	18	6	—	13	—	11	76	75
110—120 „ -	415	3,957	2,786	1,709	896	765	866	689	200	454	1,843
120—130 „ -	117	3,459	4,137	3,673	3,042	2,487	2,350	1,867	2,067	1,591	3,039
130—140 „ -	44	1,496	2,131	2,931	3,127	3,517	3,092	3,036	3,022	3,030	2,847
140—150 „ -	—	249	712	1,170	1,889	1,885	2,115	2,471	2,356	2,008	1.183
150—160 „ -	—	31	171	399	699	893	1,002	1,286	1,367	1,515	452
160—170 „ -	—	62	39	93	272	372	445	473	733	909	163
Upwards of 170 lbs.	—	—	8	7	69	81	111	178	244	417	42
Totals at each age	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

United Kingdom.

Compared with the corresponding return in the previous year an increase of 29 per 10,000 finally approved has occurred in the proportion of recruits under 100 lbs. in weight, of 399 in that of recruits between 130 and 140 lbs., of 15 between 140 and 150 lbs., of 15 between 150 and 160 lbs., and of 13 between 160 and 170 lbs. in weight. The proportion of recruits per 10,000 between 100 and 110 lbs. in weight has decreased by 11, of recruits between 110 and 120 lbs. by 104, between 120 and 130 lbs. by 350, and of recruits over 170 lbs. in weight by 6.

Omitting boys, the highest proportion of recruits approved was between 18 and 19 years of age and between 120 and 130 lbs. in weight, namely, 4,137 per 10,000. The next highest number was 3,957 per 10,000 among recruits between 17 and 18 years of age and between 110 and 120 lbs. in weight. In the preceding year the relative position of these two proportions was reversed, the greatest proportion being at the younger age and lower weight. With regard to the recruits approved between 18 and 19 years of age there is a proportional increase in those weighing over 130 lbs., as compared with 1895.

In the next table are shown the chest measurements of recruits finally approved and the proportion of each measurement per 10,000. The table also shows the chest measurements arranged in series according to age, together with the proportion per 10,000 of each chest measurement at each age.

TABLE VIII.

Chest Measurement of Recruits finally approved for Service.	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Total at each Chest Measurement.
Under 31 inches -	1,203	10	6	—	—	—	—	—	—	—	1,219
31—32 inches -	112	25	79	19	5	3	2	—	—	1	246
32—33 " -	38	105	1,685	433	115	39	49	21	7	4	2,496
33—34 " -	14	121	5,962	2,351	873	511	306	188	117	36	10,479
34—35 " -	4	44	4,111	2,500	1,212	930	606	467	319	83	10,284
Above 35 inches -	1	16	1,577	1,443	987	851	654	615	457	138	6,739
Totals at each age	1,372	321	13,420	6,746	3,192	2,340	1,617	1,291	900	264	31,463

Chest Measurement of Recruits finally approved for Service.	Proportions per 10,000 at each Age.										Total proportion of each Chest Measurement per 10,000.
	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
Under 31 inches -	8,769	312	4	—	—	—	—	—	—	—	387
31—32 inches -	816	779	59	28	15	13	12	—	—	38	78
32—33 " -	277	3,271	1,256	642	361	166	303	163	78	151	793
33—34 " -	102	3,769	4,443	3,485	2,735	2,184	1,892	1,456	1,300	1,364	3,331
34—35 " -	29	1,371	3,063	3,706	3,797	4,000	3,748	3,617	3,544	3,220	3,269
Above 35 inches -	7	498	1,175	2,139	3,092	3,637	4,045	4,764	5,078	5,227	2,142
Total -	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

United Kingdom.

Compared with the return for the preceding year an increase of 27 has occurred in the proportion of recruits under 31 inches chest measurement, of 14 in that of recruits between 31 and 32 inches chest measurement, of 117 between 33 and 34 inches chest measurement, and of 106 between 34 and 35 inches chest measurement. The proportion of recruits over 35 inches chest measurement has decreased by 84, and that of those between 33 and 34 inches by 180.

Omitting boys, men of 25 years of age and upwards with over 35 inches chest measurement give the highest proportion, namely, 5,227 per 10,000. In the previous year the highest proportion was at the corresponding age and chest measurement. The proportion is, however, dependent upon a comparatively small number of approvals. Taking the age at which the greatest number of recruits are approved, 18 to 19 years, it is found that the highest proportion per 10,000, namely, 4,443, had a chest measurement of 33 to 34 inches, as compared with 4,220 at the same age and chest measurement in the previous year.

Excluding boys under 17 years of age, the following general results are obtained. The average age of recruits finally approved during the year was was 19·3 years, as compared with 19·4 in 1894; the average height was 5 feet $5\frac{9}{10}$ inches, the same as in the preceding year; the average weight, 125·8 lbs., as compared with 125·2 lbs. in the previous year.

The next table shows the state of education of recruits finally approved, together with the proportion per 1,000 of those well educated, able to read and write, able to read only, or unable to read.

TABLE IX.

—	Numbers finally approved.	Proportion per 1,000.
Well educated	2,166	69
Able to read and write	28,278	899
Able to read only	357	11
Unable to read	662	21
Total	31,463	1,000

Compared with the corresponding table for the preceding year a decrease of 3 per 1,000 has taken place in the proportion of recruits returned as able to read and write, of 1 in that of recruits able to read only, and of 2 in that of recruits unable to read, while there is an increase of 6 in the proportion of recruits returned as well educated.

United Kingdom.

HOME STATIONS.

SANITARY CONDITIONS.

North-eastern District.

The Principal Medical Officer, Surgeon-Colonel W. D. Wilson, M.B., reports that the general health of the troops has been good during the year and compares very favourably with previous years; but, at the same time, he draws attention to the excessive prevalence of venereal disease, especially at Sheffield and Leeds, the admissions in the former station amounting to one quarter or one-third of the average strength, and in the latter to one half. For the whole district, however, venereal disease was less than in 1895, although the admissions for secondary syphilis alone were greater. At *Beverley* the troops enjoyed excellent health and improved in physique. Measles was epidemic amongst the children. The sanitary conditions were fairly satisfactory, an additional flushing tank having been constructed in connexion with the drains at the south-east corner. Further improvements are in contemplation. The chief sanitary requirements are the reconstruction of the ablution rooms, noted as being in very bad condition, and better accommodation at the hospital for the examination of recruits.

At *Bradford* new drains with flushing tanks have been constructed throughout most parts of the barracks. The hospital is old and difficult to keep clean and warm. The same difficulty with regard to warmth is noted in the barracks, which are much exposed. There was no special prevalence of disease. At *Derby* measles was prevalent amongst the children. No sanitary defects or improvements are noted.

At *Halifax* a prevalence of sore throats and bronchial catarrh, attributed to the inclement weather and exposed position of the barracks, was noted. There was a case of poisoning by carbolic acid, taken while under the influence of drink. There was no epidemic disease, and the sanitary condition of the barracks is reported satisfactory.

At *Leeds*, although zymotic disease is stated to have been prevalent amongst the civil population, there was very little among the troops. Venereal disease, however, was extremely prevalent. Amongst the sanitary improvements during the year, it is noted that additional surface drainage has been constructed, and hot water has been laid on to the baths. Sanitary requirements are an isolation ward for infectious diseases and the reconstruction of the old cobble stone pavement about the stables. The married quarters, built on the back-to-back principle, are also considered unsatisfactory.

At *Leicester* the health of the troops was very good. Considerable improvements were made during 1896 and in the previous year in the surface drainage, which is now satisfactory. The latrines are on the dry earth system, except in the hospital and officers' quarters, when the sewage is conveyed to filtering beds. The hospital sergeant's quarters have been improved by the additions of a third room, scullery, and modern cooking range. It is noted that the infectious disease ward has no bath or separate latrine accommodation.

At *Lincoln* the water supply is unsatisfactory, especially in time of drought. The analysis does not give good results, but both the medical officer in charge and the Principal Medical Officer state that the health of the troops has not suffered. The sanitary condition of the barracks, &c. is otherwise satisfactory. A few cases of ague, due to local causes, were noted during the year.

The sanitary condition of *Newcastle-on-Tyne* is also reported to be satisfactory, the only unfavourable remark being to the effect that venereal disease was very prevalent.

At *Pontefract* a marked increase in venereal disease is reported. Otherwise the health of the troops was good. The water supply is unsatisfactory. The well water, previously used, was condemned as unfit for drinking purposes and is only employed for cleansing, &c. Drinking and cooking water is

United Kingdom.

conveyed in water carts from the town. It is stated that the town water supply will shortly be laid on throughout the barracks. The surface drainage is in an unsatisfactory condition, and water lodges in pools on the surface. The provision of waterclosets and baths for the married quarters, and of concrete platforms for the urine tubs, and the removal of the slop sink disconnection traps further away from the point of discharge are noted as sanitary requirements.

At *Richmond* nothing of importance is noted. At *Scarborough* the prevalence of disease was slight. There were very few admissions for venereal disease, and, although measles was epidemic in the vicinity, only three cases occurred amongst children on the strength. Amongst sanitary improvements during the year it is noted that modern grates were supplied to the hospital. The sanitary defects noted are the absence of a mortuary, foul linen store, and ward for infectious diseases.

At *Sheffield* there were several cases of scarlet fever amongst the troops, and venereal disease of a very severe type is reported to have been prevalent. The barracks generally are in good sanitary condition, but several points are noted as requiring consideration, notably the provision of a hot water supply to the ablution rooms and a new cooking range to the Royal Artillery kitchen. The medical officer in charge reports want of cleanliness amongst the young soldiers and directs special attention to the need of hot water. He recommends iron receptacles in place of the old ash-pits, and refers to the hardening of the ammunition boots, by the kind of blacking used, as a cause of sore feet. He notes, also, the insufficiency of quarters for the married soldiers as a cause of infectious disease spreading to the troops through men living in lodgings. Several improvements have been effected during the year in watercloset and latrine accommodation. Roof lights have been provided to latrines, and a new urinal constructed for the Infantry sergeants' mess, and a latrine for the Royal Artillery married sergeants. The main drain was diverted from under the married quarters, but it is noted that both surface and deep drains generally need overhauling. At the hospital, a boiler in the old wash-house has been fitted for boiling the clothes of itch cases, the old ablution room has been removed, giving additional light to a dark passage, and other minor improvements were effected.

The reports from *Strensall Camp* are satisfactory; but the water supply requires to be watched, as it is stated to be obtained from reservoirs fed by the River Foss, which drains the surrounding country. The water is filtered through sand and charcoal filter beds. The latrines are on the dry earth system, and the urine is collected in cemented tanks, pumped out periodically and removed in sewage carts.

At *Tynemouth Castle* the chief sanitary event of the year was the completion of new quarters for the master gunner and four married soldiers. Two of the old quarters in the castle were vacated in consequence of dampness; one of them has since been rendered habitable.

At *York* the absence of a hot water supply to the baths and ablution rooms of the Cavalry Barracks is emphasized. The bath-rooms are reported to be dark and cold, and, in winter, little used; and the ablution rooms, below the quarters, inferior and uncomfortable. The married quarters of these barracks are also unsatisfactory, having no sculleries and no water laid on inside them. The Infantry Barracks are reported to have excellent ablution arrangements, the ablution room building being warmed by a stove, and hot and cold water laid on. The accommodation for married soldiers is insufficient, and some have to occupy quarters in the Cavalry Barracks and others, lodgings. At the station hospital the laundry is reported to be in bad sanitary condition, the flooring being defective, the ventilation insufficient, and the building generally too small and badly constructed. The lighting of the hospital is stated to be unsatisfactory, and there is no separate bath accommodation for the infectious ward. The improvements during the year have been the macadamizing of the road to the sick horse lines between C and D blocks of the Cavalry Barracks, the improvement of the waterclosets in the hospital, the abolition of the old urinals, and the enlargement of the foul linen store, which has also been fitted up with a trough for placing clothing in disinfectant solutions.

United Kingdom.

The defects which the Principal Medical Officer specially emphasizes throughout the district generally are the insufficiency of ablution arrangements. While most of the smaller stations have hot and cold water laid on to the baths, this is not the case in the cavalry barracks of the larger towns. "These northern manufacturing towns are very dirty, and more than ordinary " arrangements are necessary if cleanliness is to be expected. I would like to " see hot and cold water laid on to all ablution rooms, and more provision " made for hot baths."

The gymnastic training, and especially its effects on the physique of recruits, is reported upon most favourably.

North-western District.

The Principal Medical Officer (Surgeon-Colonel J. H. Hughes, M.D.) reports that the health of the troops generally has been satisfactory. Although the admission, constantly sick and invaliding rates were higher than in the previous year, there has been a decrease in the death rate, in the average sick time to each soldier and in the average duration of each case of sickness. The cases of dysentery (3) and malarial fever (12) in the district were all stated to have originated in India, and all the four cases of enteric, 2 in men and 2 in children, occurred outside barracks. At *Altcar Camp* the sanitary condition and health of troops were satisfactory. The water supply is from stand-pipes in the camp, and sea bathing is largely indulged in for ablution purposes. There is a dry earth system of latrines, and no sanitary representations were necessary during the year. At *Ashton-under-Lyne* a new water carriage system of sewerage has been completed, and the dry earth closets replaced by waterclosets. The surface drainage is under consideration, and the whole drainage system is being entirely reconstructed. The water supply is good and from reservoirs fed from the surrounding hills. Hot water is laid on to two of the three baths, but the medical officer in charge states that the bath accommodation is not sufficient. He also reports that the soil around the married quarters is difficult to keep clean and will be macadamised. Several minor improvements were effected during the year, and the sanitation of the barracks much improved. The health of the troops was extremely good.

At *Birmingham* the health of troops was good, but the barracks were vacated on the 26th August. The medical officer in charge reports that the chief defect of the barracks lies in their being in a densely crowded locality without proper means of outdoor recreation for the troops. The water supply is from rivers and wells, and it is said to be liable to pollution from villages and agricultural land, traversed by the feeding streams. It is purified by subsidence in reservoirs and filtration. A scheme is in hand for obtaining a purer water supply from the Welsh hills. The hospital defects noted are the want of an isolation ward and of accommodation for a married hospital sergeant. One or two minor improvements were effected during the year.

At *Burnley* the general sanitary conditions were not so satisfactory. The hospital water supply was found defective from corrosion of the pipes, but this defect has been remedied, and the general water supply is reported to be good and not liable to pollution. Bathing accommodation is deficient, and hot water is only laid on to the bath next the recruiting room. The drainage generally is not considered very satisfactory, and the ventilation in the old barracks is reported to be totally inadequate. The canteen is also said to be small and badly ventilated; and the hospital surgery small and badly lighted. Several cases of measles and one of diphtheria occurred amongst the children, and were contracted in school in the town. Otherwise the health of the troops was good.

At *Bury* the health of troops was good. A case of scarlet fever, contracted in the town, occurred amongst the children. The canteen tap room is too small, and this is under consideration. Otherwise the sanitary condition is satisfactory, the ventilation in prisoners' room, which was defective, having been improved. Hot water is laid on to the baths, the water supply is good and not liable to pollution, and there is a dry earth system of latrines.

United Kingdom.

At *Carlisle* the health of the troops was very satisfactory. Hot water has been laid on to the baths, and drainage and water supply are good, the latter being from the river Eden and purified through large filtration beds. The defects noted are the want of isolation and prisoners' wards in the hospital.

At *Chester* the water supply, from the River Dee, is liable to pollution by sewage discharged into it at points above the intake. An analysis, however, made at Netley during the year showed it to be fit for drinking. The drainage is good, and several minor improvements in the latrines were effected or are under consideration. A concrete pavement is recommended for the yard of the latrines, urinal, and cookhouse, and a hot water supply for all the baths, one bath only being so provided. The condition of the hospital is not considered satisfactory. The yard is small and paved with cobblestones. There is no latrine for officers; the ablution room has only one basin, and one patient only can wash in it at a time. There is no isolation or prisoners' wards, and the number of beds, 11, is too small for the headquarter station of a district, to which invalids from outstations are sent previous to invaliding. A case of scarlet fever occurred during the year and was sent to the fever wards of the Chester Infirmary. Measles was epidemic in the town, and broke out among the children in barracks.

At *Chipping Camp* the sanitary conditions were satisfactory and the health very good. The water supply is from wells, and the latrines are on the dry earth system.

At *Coventry* everything was reported to be very satisfactory. A severe epidemic of measles in the town did not spread to the barracks. The water supply is very pure, from springs in the Sowe valley.

At *Fleetwood* the chief requirements are a laid-on supply of hot water to the baths, an isolation ward for the hospital, a more modern flushing apparatus to the hospital watercloset, and new pattern basins for the ablution rooms. During the year a hot water apparatus was added to the hospital bath. The water supply is said to be liable to pollution, and only fairly good. The drainage and latrines are reported to be in very good order.

The hospital at *Castletown* (Isle of Man) was closed on 11th February on the withdrawal of the troops.

At *Lancaster* the health of the troops was remarkably good. The chief sanitary defect noted is in the married quarters. The medical officer in charge reports that the sleeping rooms are damp and without fireplaces. They were re-plastered during the year, but the dampness continued. A death from rheumatic fever occurred in a family occupying one of these quarters, and some of the families will not sleep in the damp rooms, but use the room with the cooking range as a sleeping room. The washhouse also requires enlarging, and concrete platforms for urine tubs are recommended. The water supply, from springs in the Wynesdale Fells, is good and not liable to pollution, and the ablution arrangements contain three baths with hot water laid on.

At *Lichfield* the barracks are in good sanitary condition. In two of the four bath-rooms hot water is laid on to the baths, and the drainage and water supply are good. Several minor sanitary improvements were effected during the year in the latrines and waterclosets, the floors of two of the men's rooms were renewed, and new pattern ranges supplied to A, B, C, and D blocks of the married quarters. One case of scarlet fever occurred in a man living in lodgings. The medical officer in charge states that a disinfecting apparatus is much needed.

At *Seaforth* two cases of enteric fever occurred amongst the children. Both lived in lodgings, and the attacks were attributed to a suspicious milk supply. The drainage and water supply are very good. The latter is from deep wells at Bootle, and is hard, but not liable to pollution. With regard to the ablution arrangements, the medical officer in charge states that, although two of the baths have hot water laid on, the baths are too large, and their use discouraged on account of the large amount of water required for a bath. He also notes that in frosty weather the waterclosets in the married quarters are liable to be deprived of the laid-on water supply, and under these circumstances the fact of their being inside the quarters and close to living rooms is regarded as a danger to health. Most of the medical work at Seaforth consists in examining recruits. For this purpose the surgery only is said to be available,

United Kingdom.

and the accommodation is too cramped. The accommodation for the men of the Medical Staff Corps is also considered too cramped. There is no isolation ward in the hospital, and cases of infectious disease are sent to the fever hospital of the local sanitary authority.

The *Hulme* barracks at Manchester were occupied only from 1st January to 17th March, and again from 1st May to 31st December, during the latter period by the 2nd Battalion Royal Welsh Fusiliers, who were obliged to vacate Salford. The drainage and barracks generally are reported to be of old construction, but the health of the troops was good. Although the men are stationed in one of the worst slums of Manchester, it is noted that there were no admissions directly or indirectly due to intemperance. The medical officer in charge notes defects in the ablution arrangements, no hot water being laid on to baths except at the hospital, and there the bath-room is at such a distance from the boiler that only a tepid bath can be obtained. He reports that the hospital limewashing was very unsatisfactory during the year, and that re-painting is necessary.

At *Salford* the sewerage system, except at the hospital, where the drains were put in a thorough state of repair last year, was found very defective, and the barracks were vacated in consequence on the 30th April, the troops proceeding to Hulme. The hospital is also reported to be old, without isolation ward, room for the Medical Staff Corps, steward's store, clothing or pack store, and there is no covered passage to the latrine. During the occupation of the barracks a severe type of venereal disease was noted to have been prevalent.

At *Preston* measles was epidemic amongst the children, though it did not exist to any extent in the vicinity. There were also cases of measles and scarlet fever amongst the men, and two cases of enteric. One of the enteric patients had always lived out of barracks, and had previously been for a week in a crowded lodging-house in Carlisle. The other case was a recruit, enlisted 14 days previously, who had been living in a low lodging house in Liverpool. The married quarters are reported to be very crowded, the families having only one room each during the greater part of the year. The water supply and drainage are good; the latrines are on the dry earth system, and hot water is laid on to the baths. Several minor sanitary improvements were effected during the year.

At *Shrewsbury* the health was good. The town water supply, from the river Severn, is said to be liable to pollution, but the barrack supply is from a well in barracks, and reported to be good. No sanitary defects are noted, and several minor improvements were effected.

At *Warrington* the medical officer in charge draws attention to the great prevalence of sore throats, many very severe, amongst the men. There were no cases amongst the children. All the cases occurred in the winter months, and he states that the probable cause is that "a large number of men are "recruited from iron works, &c., where they are exposed to great heat, and "hence more susceptible to diseases of this sort." Cases of scarlet fever, measles, and erysipelas also occurred during the year. There were only a few cases in the town. Nothing of importance is noted in connection with the sanitary condition of the barracks, the water supply, from wells not liable to pollution, and the drainage, being reported good. The latrines are on the pail system, and hot water is laid on to the baths.

At *Warwick* the health of the troops was excellent, and the sanitary conditions satisfactory. Several improvements were effected, especially in connexion with the kitchens and married quarters. Fireplaces were provided to the bedrooms in the militia barracks. Hot water is laid on to two of the four bath-rooms.

At *Worcester* the health was also very satisfactory. Some minor sanitary improvements were made. The water supply is reported as only "fairly good." It is from the river Severn, and liable to pollution. The latrines are on the dry earth system, and the ablution rooms are warmed by a stove, and hot water laid on to the baths.

At *Wrexham* there was one case of scarlet fever in a recruit, enlisted ten days previously. The disease was prevalent in the town. Measles continued epidemic among the children from the previous year. Minor sanitary works were effected, and the fall of the drains improved. The accommodation for

United Kingdom.

the larger families is said to be hardly sufficient, and is under consideration. The water supply is good, but hard. The ablution rooms have hot water laid on to four baths.

Throughout the district generally the physique of the troops has improved under gymnastic and graduated exercises. The Principal Medical Officer notes that coir mattresses have not yet been supplied to the district, and straw bedding is used in the various stations.

Eastern District.

The Principal Medical Officer (Surgeon-Colonel J. Maturin) reports that the health of the troops was on the whole good. Scarlet fever was, however, epidemic, especially at Warley, and is supposed to have extended there from the east end of London. Measles was also very prevalent, and enteric fever cases occurred at Norwich, Weedon, and Yarmouth. The admissions for malarial fever, 53 in number, were all attributed to previous disease in India.

At *Bedford* the health of the troops is reported to have been very good. No sanitary defects are noted, but the medical officer in charge recommends, as desirable, a room for drying the men's clothes when they return wet to barracks, and a receiving room for recruits appearing for medical inspection. There is also no disinfecting apparatus either in the barracks or in the town, but the town council is said to have the matter under consideration. At *Bury St. Edmund's* improvements were effected in the drainage, &c., and that and the water supply are now reported to be perfect. The only defect noted is the difficulty of heating the barrack rooms with the old open grates.

At *Colchester* there were 24 cases of scarlet fever amongst the men, the disease being prevalent in the vicinity. It is also remarked that all the cases of malarial fever, 45 in number, occurred in the 44th Field Battery R.A., which had recently returned from a malarious station in India. Many improvements took place during the year in the barrack accommodation. In autumn one battalion of infantry occupied for the first time the new brick barracks (Meanee Barracks), consisting of nine 2-storied blocks of 4 rooms each; and in November a new hospital, on the pavilion system, containing 231 beds, was opened, while barracks for the Medical Staff Corps are being constructed in the vicinity. The drainage of the hospital for soldiers' wives and children and officers' quarters, cavalry barracks, was improved. The defects noted by the medical officers in charge are that the surface drains want improving in parts, and that there is no adequate provision for hot water baths, especially in connexion with the cavalry barracks.

At *Harwich* everything is reported to be in a satisfactory sanitary condition, and means of flushing the drains at the militia depôt were provided.

At *Ipswich* there were four isolated cases of scarlet fever. A marked diminution in admissions for venereal disease is observed. The old earth closets are being converted into waterclosets, and a foul linen store has been provided at the hospital. There are no separate waterclosets in the isolation ward, and the mortuary table is also considered unsatisfactory. Otherwise the sanitary conditions are reported to be good.

At *Landguard Fort* the sanitary conditions, according to the report of the medical officer in charge, are not altogether satisfactory. The sewerage system is said to require improvement. Many of the married quarters have one room only, and the families are in the habit of emptying slops into a rain-water tank, as there is no proper receptacle for the purpose. Defects in the ablution arrangements, and in the ventilation of the workshops, are being remedied. The chief defect is the hospital. It has six beds, is non-dieted, and consists of one ward placed between a barrack-room and a sergeant's mess. It has no special latrine, kitchen, or ablution accommodation, and is altogether inadequate. The construction of a new dieted hospital has been provided for in the Barrack Annual Estimates for 1897–98. There were six cases of scarlet

United Kingdom.

fever during the year, treated under canvas. The medical officer in charge also notes that the adult school is badly ventilated and the infant school too small.

At *Northampton* no sanitary defects are noted. A disused drain was removed from the basement of the officers' mess, and improvements were made in the drainage of the sergeants' mess and married quarters of the militia barracks.

At *Norwich* there were two cases of enteric among the women; the first case having contracted the disease before arrival in barracks. No defects are noted. The water supply is from wells in the barracks, supplemented by water from the Norwich waterworks.

At *Warley* there was an epidemic of scarlet fever amongst the men, 49 cases in all, and of measles amongst the children. The need of a disinfecting apparatus was much felt, the medical officer stating that there was none in the barracks or in the neighbourhood. He also reports the need of accommodation for the men of the Medical Staff Corps, but notes no sanitary defects in the barracks generally.

At *Weedon* there was a case of enteric fever amongst the men and an epidemic of measles amongst the children. The water supply was not considered satisfactory, the drinking water being from a well in the barracks and the ablution water from the town waterworks, "Weedon Brook," which it was found necessary to warn the men, at their weekly inspections, to avoid drinking. The well is considered to be good and free from pollution, and was cleaned during the year. The latrines are on the dry earth syestm except at the hospital, mess, and married quarters, where there are water-closets; two new waterclosets being added to the last-named quarters during the year. Amongst other improvements effected, a foul linen store and a new mortuary table were provided. Amongst requirements or defects it is noted that there is no isolation ward at the hospital, that the artillery barracks are old, dark, and badly constructed for ventilation, and that some of the married quarters are not satisfactory.

At *Great Yarmouth* there were 2 cases of scarlet fever (the first case a militiaman and the second a man who occupied the same room), and 2 cases of enteric fever, one of which was also a militiaman. Both of the latter cases were men living out of barracks. There was also an epidemic of measles among the children. Arrangements, it is noted, were made during the year to isolate infectious diseases amongst the families in the civil isolation hospital. The medical officer in charge states that the water supply contains an excess of vegetable matter. It is supplied by the town waterworks company, and Pasteur filters have been recommended for use in connexion with it. No other sanitary defects are noted.

Western District.

Zymotic diseases were prevalent to a considerable extent in the district during 1896; outbreaks of enteric fever occurring at Pembroke Dock, measles at Devonport, and scarlet fever in the 75th Field Battery, Royal Artillery, at Horfield, just as it was proceeding to Okehampton and Aldershot. A serious and fatal epidemic of small-pox raged in Gloucester during the year, and the Principal Medical Officer, Surgeon-Major-General J. B. Hamilton, M.D., reports that, although no cases occurred amongst the troops, the epidemic caused great inconvenience to the military authorities, as recruiting within a radius of 20 miles of that city was stopped for a period of three months, and for one month longer within a radius of eight miles. At Swansea and Cardiff the epidemic stopped recruiting for 2½ months, and volunteer and militia trainings were much interrupted. With regard to malarial fevers in the district, 83 out of 142 are noted as having occurred in the 2nd Battalion Royal Lancaster Regiment, quartered at Fort Tregantle on its return from India. Venereal diseases increased, especially the admissions for primary and secondary syphilis. Generally speaking the health of the district was

United Kingdom.

satisfactory, but, as in 1895, the battalion occupying the "Citadel" barracks at Devonport, namely, the 1st Battalion of the Welsh Regiment, showed a high state of inefficiency on account of sickness, the admissions being 765 in an average strength of 622, and the per-centage constantly sick 9·43.

The following is a summary of the reports regarding the health of the troops, and sanitary conditions in the several stations of the district. At *Bodmin* there was no zymotic disease; the general health was good except in spring and early summer when sore throats, bronchitis, and rheumatism, attributed to bitter east winds, were prevalent. The sanitary condition of barracks was "excellent." At *Brecon* 11 cases of scarlet fever occurred amongst the children, the disease being prevalent amongst the civil population. The health of the troops was "unusually good"; the admission rate being 320·7 per 1,000 less than the average for the previous six years. There was less rain than usual during the year. This fact is emphasized as bearing on the health of the troops, as it is noted that during heavy and long-continued rain the natural drainage of the valley of the Usk, where Brecon is situated, is impeded and the soil becomes saturated. The sanitary conditions of the barracks generally are good, the only defects noted being insufficient warming of some of the married quarters and the want of a special room for examining recruits.

At *Horfield* the outbreak of scarlet fever in the 75th Field Battery, Royal Artillery, already referred to, caused some trouble. The disease was epidemic in Bristol and spread to the barracks from there in May. The whole of the battery affected was placed under canvas for some weeks in a large open field, and the affected districts in the city placed out of bounds. The outbreak then ceased, only four men and one child being attacked. The cases were sent to the civil infectious diseases hospital at Bristol. In November and December chicken-pox was epidemic among the children. The small-pox epidemic at Gloucester, which extended to some of the villages and towns near Bristol, interfered with recruiting in Horfield. Some defects in the drains were brought to notice during the year. Otherwise the general sanitary conditions of the barracks and hospital are reported to be "very satisfactory."

At *Cardiff* the only zymotic disease was one case of measles in a man recently returned from furlough, and another case in a child. There was a death from pyæmia in a militiaman, apparently caused by his pricking his lip with a needle. The usual militia trainings were suspended owing to the prevalence of small-pox in the locality. A general reconstruction of the drainage of the barracks was commenced during the year. The ablution arrangements are considered unsatisfactory, one bath only having hot water laid on. This is said to be insufficient for the large number of recruits coming up. The want of a waiting and examination room for recruits is also noted.

At *Devonport* the principal zymotic diseases were 30 cases of measles, 5 of scarlet fever, 1 of diphtheria, and 2 of enteric fever. Measles was also epidemic amongst the children. The case of diphtheria was contracted from a previously unrecognised case which had its origin in Lydd, where the disease was prevalent amongst the civil population. One of the cases of enteric was landed from a transport returning from Aden. The other case came from Raglan Barracks. There was a case of enteric fever, also from Raglan Barracks, amongst the children. The majority of the cases of malarial disease, 48 in all, occurred in the 2nd Battalion of the Royal Lancaster Regiment that arrived from India in February, and amongst the men of the Sierra Leone detachment of Royal Artillery.

Considerable sanitary improvements have been made during the year at Devonport, but many defects continue to be noted. At the station hospital the entire drainage was being reconstructed, and the canteen arrangements for the Medical Staff Corps, the kitchen, foul linen stores, &c. much improved. The enlargement of the pack store and the provision of an officers' ward were under consideration. The Eastern King's Redoubt is not considered suitable for the accommodation of cases of infectious disease, and an isolation ward in the station hospital grounds is recommended. Improvements in the barrack accommodation of the Medical Staff Corps, in the ablution arrangements of A block, in the lighting of the hospital, and in the means of

United Kingdom.

disinfection are also required.* At Ball Point Barracks the health of the troops was very good, there being entire immunity from zymotic disease, and nothing of importance is noted in connexion with their sanitary condition. The general sanitary condition at Forts Bovisand and Staddon are reported to be fairly good, the chief defects noted in the latter being the bad state of repair of the lavatories and the continued use of an old cesspit for kitchen refuse. A note is also made of the unsatisfactory arrangements for supplying water by hand labour. The quarters of the master gunner at Fort Staddon were declared unfit for occupation, and the insufficiency of accommodation for married families is also noted. Improved cooking apparatus have been supplied to the cookhouses at both forts, and improved ventilation to the prisoners' room at Fort Bovisand. At Maker Barracks there was nothing of importance to note during the year. The drainage has been recently reconstructed, and the health of the troops is reported to have been very good. Regarding the forts constituting the north-eastern defences of Plymouth, it is noted that the ventilation of the lower rooms at Fort Crownhill is defective; that the dry earth system of latrines (at Forts Crownhill, Egg Buckland, and Efford) has required great care and supervision to prevent them becoming insanitary; that no hot water is laid on to baths, and that complaints are made of the iron water-pipes being uncoated, and oxide of iron being, in consequence, taken up by the water. Many cases of urticaria and diarrhœa occurred, which were attributed to tinned and other articles of food obtained at the canteen. Several cases of infectious disease also occurred during the year, but the general health of the troops was considered excellent. Of the barracks in Plymouth the Citadel and Millbay Barracks are reported to be very old, and it is difficult to keep them clean and in good sanitary condition. The former are being reconstructed and one building (officers' quarters and mess) is approaching completion. New drains have been laid at Drake's Island during the year, and the discharge of the main sewer from the town is being diverted from the neighbourhood of the officers' quarters at Elphinstone barracks. A considerable proportion of the women and children in the Plymouth Barracks is on the lodging list. With regard to the Devonport barracks (Mount Wise, North and South Raglan, Old and New Granby, and Army Ordnance Corps Barracks) the chief defect brought to notice is the defective state of the drains in the Raglan Barracks, and the fouling of the bathing places by the discharge of the Devonport sewage into them. Bathing parades were stopped on account of the latter condition. A new watercloset was constructed in warrant officers' quarters, Raglan Barracks. Measles was very prevalent amongst the children during the year, and one child in Raglan Barracks contracted enteric fever. Otherwise the health of the troops has been good.

At *Exeter* there was a severe epidemic of small-pox amongst the civil population, and special precautions were taken to prevent the troops being affected, the training of the 4th Battalion Devonshire Regiment being suspended, and parts of the town put out of bounds. No cases occurred in barracks.

In January and February diphtheria attacked the children occupying the married quarters of the Higher Barracks, and was traced to a civil school close to barracks. The general health of the troops was very good. With regard to sanitary conditions, it is noted that there is insufficient hospital accommodation, a barrack room having to be used as a supplementary hospital, and that the mortuary is not sufficiently lighted, warmed, or equipped. Considerable improvements were effected in the drainage of the Higher Barracks and in the Topsham Barracks during the year, and other minor works carried out. At *Newport* nothing is noted, with the exception of the unsatisfactory condition of the mortuary, which requires a proper table, sink, and water supply. The troops at *Okehampton* are reported to have shown marked improvement in health after arrival in the camp. The sanitary conditions are good, but it is noted that the drainage into soak-pits is unsatisfactory, and open tiled surface drains are recommended. A dry earth system of latrines is in use. At *Pembroke Dock* there was an outbreak of enteric fever, which has already

---

* D block, which was approaching completion, will give four general wards, lunatic ward, chapel, and recreation room for patients and orderlies.

United Kingdom.

been detailed on page 6. Measles and diphtheria were also prevalent amongst the children, the large number of cases being attributed to the prevalence of these diseases amongst the civil population. The sanitary condition of the hospital and hut encampment is unsatisfactory. The hospital is generally unsuited for hospital purposes, the huts being old, and the position bad. The surface drainage of the encampment was much out of repair, and has partially been relaid. Some of the drains of the new married quarters were found leaking into the Fortland Well, which had shortly before been closed in connexion with the outbreak of enteric fever. New sewer pipes have been laid where the drains were defective. The water supply is from wells in barracks and rain water collected on roofs; the mode of distribution by hand is unsatisfactory, and during drought the supply was scarce. The basement of the Defensible Barracks, where the ablution rooms and cook-houses are placed, is reported to be dark and badly ventilated, the condition of the former inducing the men to avoid using the baths, &c. Water is obtained from a well in the barrack square, and during drought the supply failed. This has been remedied by lengthening the pump. The old w.c's. in the officers' mess have been condemned and replaced by others in an *annexe*. The whole system of drainage has been condemned, and is to be reconstructed. There are no married quarters in these barracks, the families being accommodated in lodgings. At Pater Battery Barracks it was noted that the water supply from the Admiralty Reservoir was limited, and its quality unsatisfactory. At South Hook, Milford Haven Barracks, the drainage was found defective, and new pipes have been laid. Improvements were effected in the housing of families at Fort Huddleston, but increased latrine accommodation is considered desirable. Fort Popton was occupied for one or two months during the year; the drainage is reported to be defective, and the drains of the hospital have been reconstructed. The water supply, from a spring outside, is liable to pollution. There is also a well inside barracks, and rain is collected from roofs. The supply failed during the summer, but a fair supply was again obtained by lengthening the pump. At Penally Barracks there is a similar report of failure in the water supply, which is derived from springs. The principal drain was relaid during the year. At *Taunton* there was an outbreak of mumps among the men, and of diphtheria and measles among the children. The case of diphtheria was attributed to the opening of drains near the quarters during reconstruction. The disease was not prevalent in the town. The measles epidemic is attributed to an epidemic amongst the civil population. An almost entire absence of venereal disease is noted. The sewerage system was improved during the year, and the old wooden floors in the latrines are being replaced with cement. The sanitary defects noted are that the w.c's. require more modern fittings, that no hot water is available for the baths, and that the rainwater pipes act as ventilators to the sewer. At *Fort Tregantle* there was an outbreak of measles amongst the children, and the schools were closed. A large number of cases of ague occurred amongst men recently returned from India. The sanitary condition is reported to be generally good, but it is noted that the accommodation for families, one room each, is very poor. A reconstruction of the drainage is stated to be under consideration.

Southern District.

The Principal Medical Officer (Surgeon-Colonel C. Mc.D. Cuffe, C.B.) reports that the general health of the troops during the year was good, the admission rate and constantly sick rate being considerably below the average. At *Christchurch* a new water supply was laid on at the beginning of December from the mains of the West Hants Water Company, in place of the previous supply from the River Stour, and is reported to be of excellent quality and unlimited in quantity. At *Devizes* nothing of importance is noted. At *Dorchester* there was a case of enteric fever in an officer, occurring one week after his arrival in the station, and, presumably, contracted elsewhere. Measles was prevalent amongst the children and in the town: and the schools

United Kingdom.

were temporarily closed. The entire drainage system was remodelled. The only defect noted is the absence of fireplaces in the bedrooms of the married quarters. At *Gosport* cases of scarlet fever and measles occurred in the outlying forts. Scarlet fever was apparently contracted in Fareham, where there was a severe epidemic, and the locality was placed out of bounds. There were two cases of enteric fever, one amongst the women and the other amongst the children. The former occurred in a family living in lodgings, the latter was attributed to defective drains in the quarters. Enteric fever is noted as being endemic in the neighbourhood, where there is said to be no proper sewage system. It is noted that the basement rooms of the Gosport Barracks are badly situated for light and ventilation and have a tendency to dampness. The ablution rooms have no laid-on supply of hot water and it is found difficult to maintain adequate warmth in the station hospital. The water supply generally, obtained from the Gosport public supply, was very scarce in summer, but a new source has since been added, and the supply is now abundant. In the outlying forts several sanitary improvements were effected. The surface drainage at Fort Monckton was improved. Additional urinals were provided at Fort Gomer and water laid on to the married quarters; while the entire drainage of Fort Grange was reconstructed. It is noted that a new main drain for the whole line of forts, emptying at Stokes Bay, is being made. The branch drains of the station hospital at Gosport were also reconstructed and the drainage of the married quarters improved. At *Hilsea* measles and scarlet fever were prevalent and there were two cases of enteric fever. Measles was prevalent among the civil population. All the cases of scarlet fever (seven) came from Portsdown Hill Forts and occurred in the last quarter of the year. They were attributed to Fareham, where the disease was epidemic, and the town was temporarily put out of bounds. The enteric fever cases were not accounted for. The general health was very good with less prevalence of venereal disease than usual. No insanitary condition was noted in the Hilsea Barracks. The quarters in Hilsea lines are reported to be dark and gloomy and the drains at Tipnor Fort frequently blocked. At Fort Purbrook the sewerage system is to be altered, as there is a risk of its polluting the Portsmouth water supply, which is derived from springs at the foot of the hills. At present the sewerage of the Portsdown Hill Forts discharges into cesspits.

At *Golden Hill Fort* (Isle of Wight) there were two cases of enteric fever. In one case the milk supply was suspected, in the other no cause could be assigned. "The hospital, as reported upon in previous years, is unsuitable for " the purpose and not at all approaching requirements based on modern ideas." Sanitary improvements were effected in the ventilation of the main sewer and in latrines and urinals. Water was laid on from the Freshwater Company's mains to several of the outlying western forts.

At *Parkhurst* there was one case of scarlet fever amongst the troops and eight of measles amongst the children. The new barracks were occupied during the year and the remaining obsolete wooden huts are in process of being replaced. The water supply for drinking and cooking is separate from that for flushing. The latter is obtained from impure sources (reservoirs and wells) and is reported to have been insufficient during the year. The drainage and waterclosets are antiquated and steps are being taken to bring the system generally up to date. A new canteen was completed during the year. At *Sandown* measles was prevalent amongst the children and amongst the civil population. It is noted that the ablution accommodation is insufficient, especially when the militia are up for training. A steam force pump has been erected at Fort Bembridge for supplying water but manual labour is still required for filling the flushing tank. Improvements were effected in the cookhouse ventilation and in rendering the floors of the rooms less pervious to damp. The master gunner's quarters were condemned on account of dampness and insufficient light. At *Portland* there was no zymotic disease. The station hospital is "a part of the casemated barracks and cannot be con- " sidered a suitable building." There is no exercise ground for the patients except the barrack square, and there is no ward for infectious cases. It is noted that hot water is much needed in the ablution rooms and a latrine and urinal in the infant school. The sanitary condition of the vicinity is said to be bad. At *Portsmouth* measles was prevalent amongst the children. There were also two cases of diphtheria, one amongst the troops and one amongst the children, both from Colewort Barracks; but no cause could be assigned. There were five cases of enteric fever; two were men of the Royal Engineers in Milldam Barracks, who frequented a house in Portsea together, two came from Colewort Barracks, where the sanitary conditions are said to be good, and the fifth case was a man recently returned from furlough at Basingstoke. The general sanitary condition of the station was good and no extensive improvements were made or required. The hospital is noted as being an old building, gloomy and draughty, with deficient accommodation for the married men of the Medical Staff Corps and for stores. An operation room is also reported to be much needed. At *Southampton* and at *Trowbridge* nothing of importance is noted. At *Weymouth* there was an epidemic of measles amongst the children. Many families are on the lodging list, the married quarters' accommodation being insufficient. At *Winchester* measles was prevalent amongst the children and civil population, and two recruits, recently joined, were attacked. No insanitary conditions are reported.

Netley.

The Principal Medical Officer, Surgeon-Major-General W. Nash, M.D., reports that there were three cases of diphtheria and one of scarlet fever amongst the men; no cause being assigned. Amongst the children measles was prevalent and there was one case of enteric fever; also untraced. It is noted that "the Hermite system of sewage disinfection is now complete and works satisfactorily," and that the new disinfecting apparatus (Equifex) was taken into use and also gives satisfactory results. The reconstruction of the drainage system of the lunatic asylum was completed during the year and all the water-closets and urinals brought up to date. Water supplied on the Hermite system is now used for all sanitary purposes "to the great advantage of the patients." Incandescent light is used in the recreation room and is "a great success."

Thames District.

The Principal Medical Officer (Surgeon-Colonel R. P. Ferguson) reports that the health of the troops has on the whole been very good, and the year under review compares favourably with the previous year. A notable decrease occurred in admissions for respiratory diseases and rheumatism. In Chatham, for example, the admissions for the former class of disease were 71 in 1896, as compared with 277 in 1895, and throughout the district the rate was reduced to 27·44 per 1,000, or nearly one-half of the previous year's rate. The great diminution in these diseases at Chatham is attributed, not to any special mildness of weather during 1896, but rather to the probability that the excessive rate in 1895 was due to some epidemic influence, which was absent in 1896. At *Chatham* there were two cases of measles, 16 of scarlet fever, and one of enteric fever among the troops, one case of enteric fever among officers, and an epidemic of measles amongst the children. There were also nine cases of scarlet fever amongst the children. The epidemic of measles occurred in spring and the infant schools were closed. The origin of the cases of scarlet fever was not traced and the case of enteric fever amongst the men developed itself shortly after the patient's arrival from India. The source of the other case is not noted. There were four cases of diphtheria among the children attributed to probable contagion from the civil inhabitants, amongst whom the disease was said to be prevalent. Amongst the remarks on the general sanitation of Chatham Barracks a strong opinion is expressed concerning the cold and comfortless condition of the ablution rooms, especially in the Lower Chatham Barracks. The rooms are being improved, but it is thought very

United Kingdom.

desirable to have hot water laid on to them, although it is noted that hot baths can be obtained for a small sum at the Soldiers' Institute. The same remarks apply to the ablution rooms in the Brompton Barracks. A new latrine was erected in connexion with the married quarters in Upper Chatham Barracks, the drainage in Brompton Barracks and the ventilation of the auxiliary hospital were improved and a new system of ventilation is in hand for St. Mary's Barracks. These last-named barracks are cold and damp in consequence of their low-lying position and extra fuel is sanctioned for warming them. At the Gunwharf Barracks the sanitary condition is generally satisfactory, but there is a system of old drains, the outlet of which is said to be unknown. The chief zymotic diseases at *Gravesend* were three cases of measles and six of scarlet fever amongst the men, and five of measles and three of scarlet fever amongst the children. The cases of scarlet fever were introduced from other stations by musketry detachments, with the exception of one case, which occurred in a man of the Medical Staff Corps, engaged in nursing the other cases. The musketry ranges are reported to be wet and sloppy, but the health of the men using them did not suffer, and they are provided with shelter sheds containing dry earth latrines and urinals. An isolation ward for infectious diseases is required at this station. At *Maidstone* measles and diphtheria were prevalent in the town, and 23 children were attacked with the former and one with the latter disease in barracks. A new bath has been erected at the station hospital and some defects in one of the officers' quarters remedied. At *Sheerness* there was scarcely any zymotic disease, although it is noted that scarlet and enteric fevers and diphtheria are prevalent amongst the civil population, for whom there is no hospital accommodation or disinfecting chamber. A fatal case of enteric fever occurred amongst the officers, and the milk supply was suspected in consequence of the insanitary condition of the farm from which it came, but the result of a bacteriological examination was negative. Other zymotic diseases amongst the troops were: two cases of measles amongst the men, and one of measles and one of diphtheria amongst the children. It is noted that the water supply for the troops is from a deep well in War Department ground and is ample and good, being quite independent of the town water supply, which was said to be irregular and deficient from imperfect working of the pumping engines. The Goux system of conservancy in the new barracks is stated to require much care and supervision to prevent its becoming insanitary. The infectious diseases ward in the hospital was not properly isolated and a partition was erected in the main corridor to remedy this. Many drains were relaid at Garrison Point Fort. At *Shoeburyness* there were two untraced cases of scarlet fever, one among the men and the other among the children. Measles was prevalent in the neighbouring villages and 21 children were attacked. Enteric fever accounted for five admissions amongst the men, five amongst the children, and two amongst the women. The disease was reported to be prevalent in the villages in the vicinity and in Southend, the sewerage of which is discharged into the sea at the Maplin Sands, which extend along the entire front of Shoeburyness. All the cases of enteric fever amongst the men are noted to have been confined to men belonging to the school of gunnery, whose duties on the ranges necessitated their frequent presence on the sands. The cases occurred in March, April, July, August, and October, and nothing insanitary in the barracks or water supply was detected, the latter being from an artesian well. Four of the cases amongst the children occurred simultaneously on the 11th August, and the fifth case on the 31st August, and the outbreak was attributed to the fact that the children, during the school holidays, had played on the Maplin Sands where the outlet of an infected sewer existed. In connexion with the prevalence of enteric fever from this cause it is noted that the sanitary condition of the villages in the vicinity is being greatly improved by the introduction of a new water supply and drainage scheme. In the barracks many important improvements in drainage and ventilation were carried out, and a building constructed for a disinfecting chamber at the hospital. The married quarters are dilapidated and old, and the construction of new married quarters is considered necessary.

South-eastern District.

United Kingdom.

With regard to the general health of the troops the Principal Medical Officer (Surgeon-Colonel H. Comerford, M.D.) reports that the admission and death rates were lower than in the previous year, but that the invaliding rate had doubled. The latter circumstance "was intimately connected with the route marching during the year," which was "more severe than in the preceding" year. "Any infirmities among the men which would interfere with their "capacity for this training became apparent at once, and after their inefficiency "was established they were invalided out of the service. This is the sole "reason for the increased number of invalids." There were very few outbreaks of zymotic disease during the year. The principal facts connected with them are noted below. Malarial fever gave 228 admissions, and most of the cases occurred in the 2nd Battalion of the West Yorkshire Regiment, which returned from the Ashanti Expedition on the 23rd February, and occupied the Western Heights at Dover. The medical officer in charge states that "the battalion was recommended to be relieved of all garrison duties, "and as many men as possible sent on furlough. The results were most "satisfactory." There were two cases of sunstroke, one during a march on a hot muggy day in June from Dover to Dymchurch, and the other after a march from Arundel to Brighton in similar weather. The former case recovered, but had to be invalided out of the service; the latter proved fatal.

At *Brighton* there was a case of enteric fever among the officers. The disease had been contracted while on leave away from the station, and declared itself five days after the return of the officer to duty. There was an outbreak of measles amongst the children, introduced by a family from Chichester. The medical officer in charge of the station hospital reports that extra fireplaces have been opened in three large wards, but that they are not of much use unless additional allowance of fuel is provided; the coal store is too small; the lavatory has been improved. The barracks are old and the guard room insufficiently warmed. Bath accommodation for the troops and families is also considered inadequate.

At *Canterbury* there were several cases of measles amongst troops and children, traced to infection from the town. There were also two isolated cases of scarlet fever, the source of which was unknown. The barracks are old, with the exception of a married block, and one of the blocks had to be closed, as it was in an unsafe condition. The surface drainage is defective in parts, otherwise the drainage is said to be excellent. The infectious diseases ward at the hospital is not properly isolated, and additional means of warming the wards are recommended. Quarters for the nursing sisters are needed nearer the hospital. There is no separate lavatory for the Medical Staff Corps men, and the disinfecting room is obsolete, articles being disinfected, as required, at the disinfecting chamber belonging to the local civil authorities.

At *Chichester* no sanitary defects are said to exist. There were a few cases of measles amongst the children and one case of scarlet fever amongst the women. At *Dover Castle* there were two isolated cases of scarlet fever amongst the men, and several cases of measles amongst the children. The faulty lighting and ventilation of the casemates in the chalk cliff are referred to, but it is noted that the health of the troops occupying them remained good. At Fort Burgoyne the casemates are damp in winter owing to the clay soil. The drainage of the camping ground, officers' quarters and stables there has been improved, and the earth closets at the guard room converted into waterclosets. Measures have also been taken to remedy the dampness in some of the married quarters and offices at Dover Castle. The hospital latrine and Constables' Tower drainage have been improved and other minor works effected. At the *Western Heights* Barracks there was a widespread epidemic of measles amongst the children during April and May, the infection being introduced from the town. The schools were closed and the families of the 4th Battalion, King's Royal Rifles, prevented from proceeding with the battalion to Aldershot for seven weeks later, when they were declared free from the disease. There were two or three isolated cases of scarlet fever and one of diphtheria. The surface drainage of the South Front Barracks was improved and repaired during the year, and a concrete floor provided and repairs to

United Kingdom.

drains made in quarters in Grand Shaft Barracks. It is noted that the wooden floors of the hospital waterclosets require to be replaced by concrete floors.

At *Eastbourne* there was a case of small-pox in a man of the Sussex Artillery, who had come up for training three days previously from his home in Worthing, where it was found there had been another case. There were admitted to the station hospital, as convalescents, 32 patients from the station hospital, London, 20 from Canterbury, 5 from Dover, and 1 each from Chichester and Kingston. With very few exceptions they all benefited greatly by the change. The lighting of the hospital by paraffin lamps is considered unsatisfactory; and it is also noted that the cells at the Redoubt and married quarters at the Ordnance Yard are damp. The latter are badly ventilated and generally unsuitable for families.

At *Hythe* there were one or two cases of measles among children. Improvements were made in the arrangements for cooking, and the officers' mess, lavatories, &c. were reconstructed. Some insanitary conditions in the vicinity of the quarters were remedied by the local sanitary authorities. At *Lydd* there were two cases of scarlet fever and one of measles amongst the children. The drainage of the camp was improved and new latrines provided for the Royal Artillery and Royal Engineers. The water supply is from two sources, one a spring at Christmas Dell, about 2 miles distant, supplying drinking water, and the other from the subsoil by sinking Norton's tubes. The Christmas Dell supply was scarce at first owing to the windmill, which worked the pump, failing to work. It has now been replaced by a steam pump. The Norton's tube water is said to be good and sufficient but requires filtration.

The drainage has been remodelled at *Walmer Castle.* At *Newhaven* nothing of sanitary importance is noted. There were a few cases of measles amongst the children, contracted in a civil school. At *Shorncliffe* there were a few cases of scarlet fever and measles amongst the men, and an epidemic of the latter disease amongst the families during the first quarter of the year. Scarlet fever was epidemic in the village of Cheriton, situated between Shorncliffe and Folkestone. There was one case of enteric fever, namely, a man, who had, a few days previously, arrived from Egypt. There were two cases of diphtheria among children, not traced to insanitary conditions in quarters, although it is stated that respiratory affections and sore-throats are common amongst the families occupying the old wooden huts. It is noted that much difficulty is experienced in isolating infectious diseases amongst the families. The surface drainage of the camp was improved during the year. The ablution rooms are stated to be inadequately supplied with baths in the Ross Barracks and inconveniently situated for the men occupying the old wooden huts The latrine at the Ross Barracks is considered to be too near the kitchen, and the dry-earth system (Moule's) is reported to act badly because the earth is damp, and there are said to be no means of drying it. The new hospital was occupied during the year, the administrative block in June and the central block in September. The latter is a two-story building containing four large wards, two for 24 and two for 22 beds each, with four small wards of one bed each and one of four beds. An isolated block, to accommodate nine cases of infectious disease, has also been constructed. The general arrangements are said to be satisfactory and up to date, with the exception of the ablution basins, which are noted as insufficient in number. Some of the old hospital wards are still in occupation pending the completion of the new hospital. The waterclosets and latrines in them are not satisfactory, but they are kept in as good sanitary condition as possible.

Home District.

The Principal Medical Officer (Surgeon-Colonel J. O'Farrell, M.D.) reports that the admission, death, and constantly sick rates have been lower, but the invaliding rate higher, than in the previous year. The increase in the

United Kingdom.

invaliding rate is, in the case of the Foot Guards, attributed to the "weeding out" caused by recent orders regarding route marching. At *Caterham* there were outbreaks of measles and scarlet fever amongst the men; 28 cases of the former being admitted between February and June, and 24 cases of the latter between September and the end of the year. The outbreaks were probably due to disease introduced by recruits. There is great deficiency in hospital accommodation and means of isolation. A temporary isolation ward of 14 beds was obtained in a barrack room, and another barrack, with 24 beds for sick, formed a supplementary non-dieted hospital. The permanent dieted hospital contains 26 beds. It is pointed out that the accommodation for recruits is seriously reduced by the occupation of barrack rooms for hospital purposes in addition to other inconveniences caused thereby. Pollution of the water supply from the East Surrey Water Company by cesspools in the Caterham Valley is under the consideration of the Local Sanitary Authority. No ill-effects have been noted amongst the troops. The drains are occasionally blocked, and the latrines, as at present constructed, difficult to keep clean. A new gymnasium and swimming bath are considered very desirable.

At *Guildford* there was a case of scarlet fever, a recruit, and three cases of measles among children. Sore throats are noted as giving a large number of admissions, some of a severe type. They occur every year, but the medical officer is unable to assign a cause. The drinking water to the hospital, formerly drawn from a cistern on the roof, is now obtained direct from the main. An intercepting trap has been constructed between the barracks and the main drain, the lower pipes of which are said to be defective. The sewage is received on a sewage farm, a quarter of a mile distant from barracks; and the vegetables grown on the farm have been recommended not to be eaten unless cooked. At *Hounslow* there was a case of enteric fever, for which no cause could be assigned, but it is noted that the drainage is defective and is to be entirely reconstructed. The waterclosets at the hospital are also of an old pattern and will be remodelled. Measles was prevalent amongst the children, and one or two cases of scarlet fever occurred during the year. Otherwise the health of the troops was very good. At *Kingston-on-Thames* measles and scarlet fever, both prevalent in the town, occurred amongst the families. Improvements in the waterclosets and drainage were effected. The hospital requires re-roofing and some addition to its accommodation. With the exception of single admissions for measles and scarlet fever amongst the officers' families, there was no zymotic disease in the 2nd Life Guards at *Regent's Park*. The Royal Horse Guards had 14 cases of measles amongst the children. The surface drainage behind the regimental hospital was improved; and the surface and deep drainage in the Hyde Park Barracks is reported defective. The *Station Hospital, Rochester Row,* admitted 22 cases of measles, and 31 of scarlet fever from the foot battalions in London. Amongst the children there were 49 cases of measles and 7 of scarlet fever. There was one case of diphtheria amongst the women. These diseases are said to have been prevalent amongst the surrounding population. The hospital accommodation is insufficient, and 295 men were transferred to the Herbert Hospital, Woolwich, as compared with 615 in 1895, 685 in 1894, and 943 in 1893. The warming is difficult, and overcrowding scarcely avoidable. The drainage and w.c. accommodation do not come up to modern requirements. A constant water supply has been provided to B block only, and an apparatus for hot water to the bathrooms of A and B blocks. A new system of drainage was under construction at *Chelsea* Barracks, and at the officers' quarters *St. George's* Barracks. At *Wellington* Barracks the drainage is noted to be faulty in parts. The reconstruction of the drainage at the *Tower of London* was completed. Scarlet fever broke out in the 1st Battalion, Grenadier Guards, stationed there, and was probably introduced by recruits from Caterham, or by a case in the Suffolk regiment, which was relieved by them. There were four cases of diphtheria amongst children, stated to have been introduced from Guildford. A temporary detention ward for the observation of cases of infectious disease was obtained during the year. At *St. John's Wood* there were a few cases of measles amongst the children. It is noted that there is no hot water bath in the hospital. At *Oxford* there were 23 cases of measles amongst the children and two amongst the men. The drains require to be provided with inspection

United Kingdom.

pits, and with flushing tanks at the head of the system. The drains of one portion, the sergeants' mess, were relaid. The flushing of some of the w.c.'s in the hospital and of the latrines is said to be defective. At *Reading* nothing of importance was noted. At *Windsor* the sanitary condition of the barracks occupied by the 1st Life Guards is reported to have been satisfactory. The drainage of the officers' quarters in the infantry barracks was reconstructed, and a disused latrine removed. The ablution and bath accommodation at the hospital is reported to be insufficient.

Woolwich District.

The Principal Medical Officer (Surgeon-Colonel R. P. Ferguson) reports that the health of the troops has been good. There was one case of small-pox in a recruit who had joined a few days previously. Measles accounted for 4 admissions amongst the men, one amongst the women, and 83 amongst the children. Scarlet fever was prevalent amongst the civil population and 54 men, 1 woman, and 21 children of the garrison were attacked. Three men and 14 children were admitted for diphtheria. There was only one case of enteric fever, a man on leave from Chatham. The drainage of the Royal Artillery Barracks is in process of reconstruction and has been partially completed. Some of the back-to-back rooms have had the partition removed and the ventilation thus greatly improved, but commanding officers have complained that the alteration of structure gives less space to the men for stowing their kits. Steps are being taken to remove the latrine of the Royal Horse Artillery Infirmary to a less objectionable site. The ablution rooms of the Royal Artillery Barracks are highly praised, hot and cold water being laid on to the lavatories, but the other barracks are not so well equipped. At the Cambridge Barracks the old pattern fittings of the w.c.'s have been replaced by modern fittings and other sanitary improvements effected. At the Herbert Hospital the old pattern w.c.'s are also being gradually replaced. The hot water heating apparatus for wards and passages is reported to work most satisfactorily. A disinfecting chamber (Reck's pattern) has been in use and is stated to fulfil its purpose admirably. The beds in the hospital have been reduced from 660 to 628 by the conversion of one of the wards into a medical store, and by other minor alterations. The Principal Medical Officer states that a small isolated hospital for infectious diseases is much needed. Eight cases of scarlet fever occurred in patients in hospital for other diseases. These cases had been 8, 9, 10, 17, 20, 28, 41, and 95 days in hospital respectively. The Principal Medical Officer attributes their occurrence to insufficient isolation or infection through hospital utensils, bedding or clothing, and states that "the practice of treating "all cases of infectious diseases, officers, cadets, men, women and children, in a "pavilion of the Herbert Hospital is not at all a desirable one, as the isolation "is not complete and the separation of the diseases is difficult." A mortuary is needed at the auxiliary hospital, and a drying room at the hospital for soldiers' wives and children. At *Purfleet* there were only two cases of scarlet fever, both amongst the women and children. Better accommodation has been provided for the families. It is noted that there is no hot water laid on to the hospital bath.

Aldershot.

The Principal Medical Officer (Surgeon-Major-General T. F. O'Dwyer, M.D.) reports that the health of the troops during the year was in every respect more favourable than in the previous year, with the exception of invaliding. Invaliding, he points out, is apt to depend upon the number of new regiments arriving during the year, and the medical officer in charge of the 1st Infantry Brigade notes that the field days and route marches at Aldershot have had

United Kingdom.

the effect of "weeding out several weak and immature youths." The number of admissions for the more important zymotic diseases was considerable, namely, 12 for measles, 34 for scarlet fever, 177 for diphtheria, and 12 for enteric fever, with two deaths from the last-named disease. There were also 13 cases of "heatstroke," including one amongst officers, but none were fatal. The officers and women were remarkably free from zymotic diseases, three cases of scarlet fever amongst the former and five of diphtheria amongst the latter, being the highest number of admissions. Amongst the children there were 23 cases of measles, 23 of scarlet fever, and 55 of diphtheria, 7 of these last being fatal. The Principal Medical Officer notes that the existence in the garrison of eruptive fevers depends on the constant movement of troops to Aldershot from all parts of the kingdom, and states that the diseases did not spread in the garrison. Six of the enteric fever cases are reported to have been contracted elsewhere. The remaining six cases supposed to have been contracted in the station do not appear to have been due to water supply or drainage, but the milk supply was suspected. The enteric bacillus was found in a sample of milk, and the water supply of dairies, which supply the milk, is, as a rule, from shallow surface wells, which are extremely liable to pollution. A strong recommendation is made on the subject of an isolation ward for officers and officers' families. There being no civil hospital available for them, they are at a special disadvantage when attacked with infectious disease. The new infectious diseases hospital at Thornhill was opened on the 1st August 1896. It has accommodation for 48 sick; 24 beds for women and children and 24 for men, separated from one another by an administrative block. The arrangement of wards is the same on both sides, namely, one small ward of four beds, two wards of six beds each in a semi-detached building, and one large ward of eight beds. The Principal Medical Officer recommends the addition of a cottage for families of officers and two separate wards for officers. The prevalence of diphtheria during the year was remarkable. Amongst the 177 cases admitted amongst the troops there were no deaths. The medical officer in charge of the Marlborough Lines Hospital, where the cases were treated until the opening of the infectious diseases hospital, notes the still more remarkable fact that the epidemic commenced on the 20th May 1895, and from that date until the 1st August 1896, 541 cases of the disease were treated in the hospital without a single death. Bacteriological examination at Netley declared these cases to have been diphtheria. The disease is noted as having been prevalent in Farnboro'. There were 23 cases amongst men occupying the Cavalry Barracks in addition to another case occurring in a man on furlough for six days. This last case died, but was not shown as an admission in Aldershot. 24 cases were admitted from the Stanhope Lines, 58 cases from the 2nd Infantry Brigade Lines, and 50 from the 3rd Infantry Brigade Lines. A few cases occurred amongst the Royal Artillery and Royal Horse Artillery in men living out of the barracks. No satisfactory account is given regarding the origin and spread of the disease. A note is made to the effect that it was probably introduced from outside and spread by contagion in barrack rooms and canteens, but the medical officer in charge of the Marlborough Lines Hospital remarks that the attacks occurred in connection with the opening up of old drains and the re-construction of new drains.

Improvements effected during the year in the Royal Artillery and Royal Horse Artillery Barracks consisted of the re-construction of the entire drainage system; the provision of a new kitchen to the Royal Horse Artillery Barracks, a similar improvement having been effected at the close of the previous year in the Royal Artillery Barracks; addition of new lavatories and sinks to the Royal Artillery Barracks, new pans to the Royal Artillery latrines, and a new latrine to the children's school. The married quarters are noted as being insufficient and new blocks are in course of erection. The barracks were vacated and the troops placed under canvas at Puckeridge Hill, the Royal Artillery from 9th May and the Royal Horse Artillery from the 20th June, until the 2nd and 3rd weeks of September. Notwithstanding the wet weather the camp was remarkably healthy.

The drainage of the cavalry barracks, east and west blocks, was under process of re-construction during the year. The old drains are said to be very defective and the married quarters faulty in construction. There is no note

United Kingdom.

of insanitary defects in the Stanhope Lines, but a remark is made regarding the prevalence of venereal disease from open-air prostitution. The barracks occupied by the 2nd Infantry Brigade are reported to be in good sanitary condition, with the exception of the older blocks, "Blenheim" and "Ramillies," which are constructed without a damp-proof course or concrete under the floors. These barracks are also without hot water baths and the surface drainage is unsatisfactory. The Talavera, Salamanca, and Badajoz Barracks, occupied by the 3rd Infantry Brigade are also without hot water baths, the bath rooms being noted as cold and uncomfortable and the floors of the lavatories as needing repair. The accessories of the Medical Staff Corps Barracks are in bad condition, being portions of the old huts. A new wing of 105 beds was added to the Cambridge Hospital during the year. The accommodation is now 380 beds, which will shortly be increased to 448. The waterclosets in the old portion of the building are unsatisfactory and a scheme for re-modelling them is in hand. At the Marlborough Lines Hospital the Goux system of latrines was abolished, waterclosets brought into use, and other improvements effected. The hospital accommodation is in three blocks of the Tournay barracks, which are excellent, and in the old huts, which are bad. A new hospital is approaching completion. At the 3rd Station Hospital new baths were fitted and a latrine and urinal constructed for the guard. The means of disinfecting the clothing of venereal cases are considered inadequate. At *Woking* no insanitary condition is brought to notice. There was one case of enteric, supposed to have been contracted while on furlough, two cases of scarlet fever, and one of measles. Amongst the children there were three cases of diphtheria. Electric light has been installed in place of the old oil lamps. The sewage is temporarily disposed of in a sewage farm, 250 yards distant from barracks, pending connexion with the new drainage system of the village. No nuisance is experienced from the farm. At the *Royal Military College, Camberley*, the drainage was improved and nothing of importance is noted. The Pasteur filters supplied for the cadets have worked well. Amongst general recommendations made by the Principal Medical Officer it is recommended that drying rooms be constructed in all the barracks, one only being at present provided with a drying room, that the school of cookery be extended so as to allow of the training of men of the Royal Artillery, Royal Engineers, and Army Service Corps, other than non-commissioned officers, who cannot well be spared for the training, that the standard of recruits for the Medical Staff Corps be improved, and that means be provided for increasing the artificial light in the barrack rooms. He also notes that the proximity of the sewage farm to the new hospital in the Marlborough Lines is opposed to public sentiment.

Channel Islands.

The Senior Medical Officer (Surgeon-Lieut.-Colonel J. T. Carey, M.B.) reports that the admission and constantly sick rates have declined during the year. The mortality rate was, however, somewhat higher than the average. There was scarcely any zymotic disease, the only cases of an important character among the troops being two of scarlet fever and two of diphtheria, one of the latter fatal, in Jersey. No cause was assigned. The soldiers' families were almost entirely free from infectious diseases. In *Alderney* sanitary defects were noted in the latrines of Fort Albert and Fort Tourgis, which are old and leaking. The main drain in the former fort is being extended to high-water mark, and a new urinal has been provided. The water supply is from two sources, from a spring near the arsenal and from rain water collected on the roofs and stored in tanks under the barrack rooms. The latter supply is reported to be polluted, and, though not intended for drinking, there is apparently nothing to prevent the men using it for that purpose. A hot-water bath has been fitted in the barracks. At Fort Essex the underground stores at the hospital are very damp. It is noted that the flat concrete roofs of barracks leak and require renewing. In *Guernsey* coir bedding was issued

United Kingdom.

in place of straw. The accommodation in barracks is insufficient, and to prevent overcrowding men are placed under canvas in summer, while many go on furlough in winter. The accommodation for families was also unsatisfactory, and the barracks in Fort Jerbourg were occupied as such, the regular married quarters there being in a bad state of repair. At Castle Cornet the earth-closets are said to be defective, and the supply of drinking water to Fort Hommette has to be conveyed in barrels from a distance. In *Jersey* the Elizabeth Castle Barracks are apt to be damp and draughty, and the lighting in the schoolroom is defective. The old iron waterpipes were replaced by new. At Fort Regent two additional baths were provided, but without a laid-on supply of hot water. The light and ventilation of the gymnasium are reported to be defective. The hospital accommodation is insufficient, and patients have to be transferred to St. Peter's. An isolation ward and disinfecting apparatus appear to be very necessary. At *St. Peter's* an isolation ward is also required, and a detached married quarters for the hospital sergeant is considered desirable. The hospital is provided with earth-closets, and the water supply is from a well in the yard.

Scottish District.

The Principal Medical Officer (Surgeon-Colonel J. P. Rooney) states that the health of the troops has been very good. At *Aberdeen* and *Berwick-on-Tweed* nothing of importance was recorded. At *Ayr* improvements in the latrines of the married quarters are under consideration. At *Barry Camp* the provision of a drying shed for the men and shelters for ablution and on the ranges is recommended. Defective drainage at *Blackness Castle* was remedied. The musketry camp at *Irvine* was exceptionally healthy. At *Edinburgh Castle* there is still no station hospital. The ordinary sick are sent to Piershill, Leith Fort, or Glencorse, serious cases to the Royal Infirmary, and infectious cases to the city epidemic hospital. It has been decided, however, to provide a new hospital with 63 beds and accommodation for sick officers. The ventilation of the barrack rooms, &c., is unsatisfactory, especially in the Mills Mount Barracks. The bath accommodation is also reported unsatisfactory, and it is stated that the latrine of the Mills Mount Barracks is too near the kitchen, and that of the new barracks insufficiently lighted. The married quarters are insufficient, and it is proposed to hire quarters for ten families near the Castle. At *Leith Fort* a new hot-water system has been introduced into the hospital and officers' mess, and the waterclosets of the latter remodelled. A foul linen store has also been provided. Additional married quarters were occupied during the year, but the medical officer in charge notes that the soil underneath some of the quarters is polluted, and that there is no damp course or floor ventilation. An old foul drain, previously reported, still runs under the ordnance store. The floor of the covered way between the hospital blocks requires relaying, and a sink is needed in the surgery. At *Piershill* there were several cases of measles, chiefly amongst the children, and a case of enteric fever in a man recently returned from furlough. The surface drainage is apparently defective, and it is noted that the married quarters are mostly one room quarters. The baths are only imperfectly supplied with hot water. At *Fort George* there was a case of enteric fever in a man who had just arrived from Aldershot, and another in a child who is said to have eaten shell fish from near the sewer outfall. There were also a few cases of measles, and it is noted that the militia battalion of the Cameron Highlanders was sent to Barry Camp instead of Fort George in consequence. New baths were added to the hospital, and the lighting of one of the casemate barracks improved by opening a large window. The means of warming are said to be unsatisfactory. Water is supplied by hand labour, and apt in consequence to be deficient in quantity. The hospital required a new kitchen range and some of the floors relaying. At *Maryhill* there was an outbreak of scarlet fever, 18 cases amongst the men and 6 amongst the children. The disease was prevalent in the vicinity. There were also a few cases of measles. Hot water has been supplied to the

United Kingdom.

ablution rooms, and other improvements in the water effected. The rain-water pipes were disconnected from the drains. It is noted that the drains are occasionally blocked, that the accommodation for families is somewhat limited, and that there is no bath in the infectious disease ward, or fuel for supplying hot water to the hospital baths. At *Glencorse* the general sanitary condition is reported to be very good. The water supply is apt to be turbid after heavy rains. At *Hamilton* the health of the troops was very good. The medical officer in charge notes that the latrines are too far from the married quarters, and there is no covered way to them. The construction of the huts is stated to be faulty. At *Inverness* there was an outbreak of measles amongst the children, contracted in the town. The children attend the civil schools, which are far from the barracks, and a school in barracks is considered desirable. A canteen store is also said to be much required. The drainage from the officers' quarters was relaid, 6 in. pipes being substituted for 9 in. pipes. Improvements was made in the urinals of the hospital and barracks. At *Perth* there were five cases of diphtheria among the children. The disease was prevalent in the town, where the children attended the board school. School attendance was stopped, and no fresh cases occurred. The latrines of the barracks are said to be of an obsolete pattern, and are being replaced. There is no proper provision for the examination of recruits, the wards of the isolation hospital being used for the purpose. At *Stirling* the surface drainage has been improved. The water supply, moorland surface water, is apt to be full of sediment, and filter beds are in course of construction at the reservoirs. Scarlet fever was slightly prevalent during the year.

Belfast District.

The Principal Medical Officer (Surgeon-Colonel W. Graves) reports that the health of the troops was very good during the year. The admission, death, and constantly sick rates were less than in 1895, but the invaliding rate was more than doubled. The increase in invaliding occurred principally in diseases of the circulatory system and of organs of locomotion. There was an increase in the sick- and death rates among children on account of the prevalence of scarlet fever and whooping cough. At *Armagh*, there were single cases of scarlet fever and measles in the families. The wooden huts are old, and constantly require repair. Otherwise no insanitary condition of importance is noted. At *Ballyshannon* nothing of importance was noted. The dry-earth system of latrines gave satisfaction. There is no bath or ablution room in the hospital, but it is a small non-dieted hospital of two beds. At *Belfast* there were 53 cases of diphtheria amongst the troops, and 2 amongst the children. These were the only cases of diphtheria recorded in the district. The medical officer in charge notes some interesting facts connected with the outbreak. The cases occurred between January and August. 34 were from the Victoria Barracks, the remainder from the Willow Bank huts. The drainage of the former was very defective, and, during the months when the disease was prevalent, was being reconstructed. The ground around and beneath the floors of the Willow Bank huts was damp. None of the cases were fatal; all were mild and were neither complicated with albuminuria, nor followed by paralytic symptoms, but the diagnosis in each case was confirmed by bacteriological examination at Netley, at the British Institute of Preventive Medicine, and by the Professor of Pathology at the University in Belfast. The disease is said to be endemic in Belfast; but, with the exception of 4 cases in 1895, no cases of diphtheria among the troops have been admitted during the previous ten years. It is shown, however, that during the five years 1886–90, there were 328 admissions for throat affection as compared with 669 during the five years 1891–95; and this marked increase in throat affections is suspected to have been due to an unrecognised diphtheritic form of sore throat, similar to the cases in 1896. During these years there was no mortality from throat affections. There were a few cases of scarlet fever and measles, chiefly among the children. There were 4 cases of enteric fever, one an officer, who had

United Kingdom.

recently returned from leave of absence, another a recruit, who contracted the disease at his home; a third case developed the disease after a march from Dundalk, having been billeted on the way; for the fourth case, no cause was assigned. Several sanitary improvements have been effected during the year. Seven new blocks to accommodate 86 men each have been constructed at Holywood, 4 miles from Belfast, and a hospital for 49 beds there was nearly completed. The soakage pits at Willow Bank have been abolished, and the ground around each hut drained and concreted. The drainage of Victoria Barracks has been entirely reconstructed. The station hospital at Belfast had insufficient accommodation, and the Rifle Block, about 300 yards distant, was used as a supplementary hospital. A bath was added to the infectious disease ward, and a room for examining recruits obtained. It is noted that the cooking range at the hospital is obsolete, that there are no means of disinfecting by steam, and no waiting room for those reporting sick. Many of these inconveniences will disappear when the new hospital at Holywood is opened. At *Drogheda* the want of a hot-water bath at the small non-dieted hospital is noted. At *Dundalk* there was slight overcrowding in barracks; there is no isolation ward for infectious disease, and the married quarters are stated to be badly planned, and without sculleries. The mortuary is small, dark, and too near the kitchen. At *Enniskillen* scarlet fever was prevalent in the town and seven children on the strength of the garrison were attacked. The barracks are old, and the cells of the guard-room dark and badly ventilated. There was overcrowding in April and May, and men were placed under canvas; but the climate is damp and rainy, and considered unsuitable for camping out. In winter overcrowding is prevented by men going on furlough. An increase in the bath accommodation is considered desirable. At *Londonderry* measles and scarlet fever were prevalent amongst the children. There was an epidemic in the town. Two new Royal Artillery blocks to accommodate 22 men each, and one infantry block for 86 men were constructed during the year. Other new buildings were in course of erection. The adult school was converted into a recreation room. The drainage of the main block was reconstructed, and the hospital drainage disconnected by an inspection pit. Coir bedding was issued instead of straw to part of the garrison. At *Newry* there was one or two cases of measles among the children. The married soldiers are mostly quartered in lodgings. Some of the men sleep in the corridors of the barracks, which are cold and draughty. The following requirements are noted, an isolation ward and indoor w.c. for the hospital, a laid-on supply of hot water for the ablution rooms and baths, and a drying room in connexion with the wash-house. The ventilation of the gymnasium was improved during the year. At *Omagh* there were a few cases of scarlet fever and measles contracted in the town. No insanitary condition is noted.

Dublin District.

The Principal Medical Officer (Surgeon-Major-General A. F. Preston, M.B.) reports that the health of the troops was satisfactory. There was a decrease in both the admission and mortality rates, but the invaliding rate shows an increase of 16·17 per 1,000, or more than double that of the previous year. The increase was chiefly in diseases of the circulatory system, in tubercular disease, and, to a certain extent, in diseases of the eye and other organs of special sense. The P.M.O. states that it is difficult to assign a cause for this increase; but the medical officer in charge of the battalion of the Scots Guards at Richmond Barracks states, that " route marches have increased the sickness " and invaliding, but have benefited the majority and the service generally " by bringing out useless men." Other reports also indicate route-marching to have been the cause of an increase in invaliding. Venereal disease is stated to have accounted for one-third of the admissions in the Dublin garrison. Enteric fever accounted for 32 admissions (26 men, 1 woman, and 5 children) with 7 deaths amongst the men and 2 amongst the children. The chief facts connected with these cases are noted below. The number of admissions is

United Kingdom.

twelve less than in the previous year, and the disease is noted to have been very prevalent amongst the inhabitants of Dublin. Scarlet fever was also prevalent in the district and caused 64 admissions (21 men, 3 women, and 40 children). There were 9 cases of measles amongst the men, 1 amongst the women, but only five amongst the children. At *Athlone* there was one case of scarlet fever, and one of enteric fever. The latter occurred in a man recently returned from furlough in England. In consequence of an outbreak of enteric fever in the barracks in 1895, the drainage in Pump Square, Infantry Barracks, was reconstructed during the year under review. There was an outbreak of diarrhœa amongst the men in March, and a barrack room had to be appropriated temporarily to supplement the hospital accommodation. The medical officer in charge could not trace the cause of this outbreak. There was also an unusual number of admissions for diseases of the circulatory system among young soldiers, which he states have likely been "due to strain before "enlistment or developed during the route-marching season." It is noted that there is not sufficient allowance of coal for warming the hospital, that the hot air disinfecting chamber cannot be heated above 230° F., and that there is no room for the medical officer in the hospital; otherwise the sanitary condition of the barracks is satisfactory. At *Birr* there was no epidemic disease. The general sanitary condition of the vicinity of the barracks is said to be bad, but the local sanitary authorities are effecting some improvements. A number of the families live in lodgings, which are reported to be insanitary. The drainage is said to be faulty. The water supply, from a pond close to the barracks, is insufficient in drought, and has to be supplemented by river water. The ablution rooms are inconveniently situated, and hot water is not laid on to the baths. At *Castlebar* drinking water is supplied in barrels from a well in the town. Tanks outside the hospital gate supply water for other purposes. A scheme for a better water supply to the town generally is under consideration. At *Dublin*, the hospital building at Arbor Hill is old and dilapidated, and during the year 5 wards of 3 beds each had to be closed, and a barrack room temporarily appropriated as a supplementary hospital. There were 4 cases of enteric fever from the Royal Barracks. Three of the cases were supposed to have contracted the disease in the town; the fourth had recently arrived from the Wellington Barracks. The general sanitary condition of the Royal Barracks is good, there being a modern system of drainage and Vartry water supply. Itch became prevalent, but was stamped out by energetic measures. It is noted that the ventilation of the infantry guard-room cells is poor, and that all but the staff married quarters are unsatisfactory, being only one-room quarters. At Beggar's Bush Barracks the health of the troops was remarkably good. There was one case of enteric fever in a child. The general sanitary condition was very satisfactory; there are new drains and Vartry water. New latrines were constructed during the year on the site of the old latrines; a new watercloset and urinal were constructed at the guard room, and improvements effected in the water supply of the cook-house, officers' mess and hospital. In the kitchens of the married quarters the ranges were renewed and the flooring of the huts, canteen, and library improved. It is noted that the fuel allowance is insufficient for warming the hospital in winter, that there is no medical officers' room, and that the accommodation for the Medical Staff Corps on the top landing is inadequate. At Portobello there were 2 cases of enteric amongst children, both living in lodgings, and 1 in a man, who had recently come from Island Bridge Barracks, and was at the time employed on fatigue duty there. The invaliding was heavy on account of the discharge of men unable to do route marching, but the medical officer in charge notes that route marching had a salutary effect on the rest of the troops. During the year the drainage was reconstructed, and the west half of the barracks was completed and taken over by the 4th battalion of the King's Royal Rifle Corps. During the reconstruction of the drains, the hospital was evacuated from the 4th July, and the N.E. block of the barracks utilized as a temporary hospital. The old hospital of 56 beds has not sufficient accommodation for the sick of the garrison, and is deficient in such accessories as receiving room, recreation room, dining room, and scullery, while the quarters for the Medical Staff Corps, consisting of two small cheerless rooms in rear of the hospital, are considered unsatisfactory. Wellington Barracks are reported to be old and

United Kingdom.

unsatisfactory, and a scheme of reconstruction is under consideration. There were three cases of enteric fever during the year, but their origin was not traced. There is at present a dry earth system of latrines, which works fairly well. The surface drainage seems inadequate, and several old underground drains are stated to exist. There are only eight quarters for married soldiers, and about 30 families live in lodgings. During the year six ablution rooms were reconstructed, but there are only two baths, and no hot water is laid on. At Richmond Barracks there was an outbreak of scarlet fever, partly caused by contagion from a convalescent from London, and partly from cases amongst the civil population. Enteric fever, which caused seven admissions in the previous year, gave four in 1896. One of these cases is supposed to have originated by submersion in the Liffey; the source of the other cases was not traced, although at one time canal water was used for ablutionary and flushing purposes; and it was also considered possible that the dry earth latrines had become infected. Vartry water was laid on throughout, and a disinfectant, carbolic acid powder, was mixed with the dry earth. It is reported that no case has occurred since this was done. The vicinity of the barracks is said to be insanitary. The flushing of drains was considered inadequate with Vartry water only, and an arrangement has since been made for flushing them with canal water. New latrines were constructed at the hospital and chapel, and new boarded flooring on a concrete base put into the barrack rooms. A hot-water apparatus was supplied regimentally for use in the bath rooms. At the hospital the fuel allowance is reported insufficient in winter; the lighting was bad and new gas pipes were provided. It is noted that there is inadequate space for open air exercise at the hospital; that the officers' latrine is too far from the quarters; and that in the married quarters no water is laid on and the slop sinks are inconveniently placed. At the Royal Infirmary a man of the Medical Staff Corps contracted enteric fever while in attendance on cases. New latrines and lavatory for the Army Medical Staff and Medical Staff Corps were provided. It is noted that the fuel allowance was insufficient for warming the hospital, and that the dirty linen store is used also as a store for barrack bedding. The position of the Medical Staff Corps' barrack room above the wards and the fact that the only entrance to the hospital is by a back door are considered objectionable. The existing store for medical and surgical equipment in the basement is damp, and a new store is desirable. The Island Bridge Barracks are reported to be old and gloomy, but the married quarters are modern and good. The neighbourhood is insanitary. The drains are considered to be defective, being old, square-built, masonry drains, and the system of latrines obsolete. Five cases of enteric fever occurred in these barracks in the early part of the year, and ten in the latter part of 1895. The barracks were consequently vacated on the 2nd March, and canal water, which was used for watering the horses, cut off, and only Vartry water supplied. Since then the married quarters have been occupied from time to time, and at the end of the year all had been re-occupied, and one barrack was being used by men of the Remount Depôt, without any further outbreak of disease. The Linen Hall Barracks were vacated on the 30th November for the reconstruction of the drainage system, which was old and defective. The Marlborough Barracks are new, and in good sanitary condition. Two cases of enteric fever occurred, the origin of which was not traced. The married quarters are not sufficient, and some families live in lodgings. The women's latrine at Marshalsea Barracks is insanitary and is noted for reconstruction. No water is laid on to the several landings of the married quarters. The drainage of Ship Street Barracks was partially reconstructed during the year. Part of these barracks is old, and has been condemned, and the surroundings generally are insanitary. At *Galway* a disinfecting room for militia clothing was provided. There were two cases of scarlet fever, otherwise there was nothing of importance to note. At *Longford* cases of scarlet fever occurred amongst recent arrivals. No insanitary condition is noted in barracks. The vicinity is said to be insanitary, but a new water supply has recently been provided, and blocks of artizan dwellings erected in the town. At *Mullingar* there were also a few cases of scarlet fever. It is noted that the vicinity of barracks is insanitary, that there is no proper water supply to the town, and that infectious diseases are not notified. The water supplied to barracks is by contract from two wells in

United Kingdom.

the convent yard. The hospital has no proper disinfecting chamber, isolation ward, prisoners' ward, or foul linen store. The climate is damp, and the fuel allowance said to be insufficient for warming the hospital. A new ablution room, with seven baths, and a new cook-house have been added to the barracks during the year. There is insufficient accommodation for married soldiers. At *Naas* there was no epidemic disease. It is noted that the site of the barracks prevents the surface drainage being satisfactory. The climate is very damp, and straw bedding is considered unsuitable, and the fuel allowance insufficient. The married quarters are modern and good. The water supply from wells is fairly good in winter, but in summer indifferent. At *Sligo* there was a case of enteric fever in a man living in lodgings. There are no married quarters, and the lodgings are said to be insanitary.

Cork District.

The Principal Medical Officer (Surgeon-Colonel W. E. Riordan) reports that the admission, mortality, and constantly sick rates show considerable decrease during 1896, while the invaliding rate is fairly stationary. The garrison of the town of Cork itself shows, however, a remarkably high invaliding rate, 45·53 per 1,000 of strength, and the medical officer in charge states that there is no reason for this increase, "except that the greater "attention paid to route marching of late tends to bring out the men's weak "points." Further on he states, "The present system to my mind certainly "increases invaliding and sends men to hospital, brings out their weak points, "and tends to break them down sooner than if they were allowed to take "things more quietly." At *Ballincollig* there was one case of enteric fever, the source of which was not traced, one case of scarlet fever, and one of diphtheria among the families. The vicinity of the barracks is insanitary, and throat affections are said to be prevalent in barracks and in the neighbourhood. There is a dry-earth system of conservancy, and the water supply is good. The ablution rooms are damp and dark. Two new baths were added during the year, and a new boiler provided for the cook house. No water is laid on to the bath in the infectious disease ward of the hospital. At *Buttevant* there were one case of enteric fever and three cases of diphtheria among the families. The case of enteric was a woman who had arrived from Sheffield the day before she reported sick. The diphtheria cases all occurred in October, and were supposed to be connected with one another. The first case was in a quarter where diphtheria had occurred in the previous year. The married quarters are insufficient, and new quarters are being constructed. Amongst improvements effected during the year, it is noted that the floors of the earth-closets were renewed, sewage tanks repaired, and ablution room re-fitted. At *Cahir* there were no infectious diseases. It is noted that two latrines in the officers' quarters have been condemned, and new latrines are to be constructed. With the exception of the w.c.s in these quarters and in the hospital, there is a dry-earth system of conservancy. At the hospital there is no foul linen store and the surgery is considered small and inadequate. At *Carrick-on-Suir* and *Clogheen* nothing insanitary is noted. At *Clonmel* there was one case of scarlet fever amongst the men, and two cases amongst the children, among whom there was also one case of diphtheria. Nothing is noted concerning the origin of these cases. The town water supply was laid on to the barracks, and is considered pure and abundant. At *Cork* there were one case of measles, one of scarlet fever, and five of enteric fever, including an officer, amongst the men, and two of scarlet fever amongst the children. The origin of none of these cases was traced. The water supply of the garrison is the Corporation water supply, taken from the river about two miles above the town. It is said to be good and sufficient, but is considered exposed to pollution and suspicious after heavy rains. No disease, however, has been attributed to it. At Fort Elizabeth, originally a civil prison, the barracks, with the exception of the married quarters, are said to be "dingy" and ill-ventilated, and the guard

United Kingdom.

room very old, damp, and badly constructed and ventilated. At Fort Cat nothing insanitary is noted. The Cork barracks are old, and hot water is desirable in the ablution rooms. It is noted that a swimming bath for the troops, a hospital for soldiers' wives and children, and a barrack room for the Medical Staff Corps within the hospital grounds are also desirable. During the year the lighting of the infant school was improved, a pharmacy provided, a new range placed in the hospital kitchen, and minor improvements effected. At *Fermoy* there were one case of scarlet fever, one of diphtheria, and three of enteric fever, two of which were fatal. The case of scarlet fever was a man who had returned from Great Yarmouth off furlough the day previous to admission. The diphtheria and enteric cases were not traced. There were three cases of measles amongst the children. It is noted that the hospital bath hot-water apparatus is old and does not work well, and that the gas lighting is unsatisfactory. The gas pipes were repaired. The ablution rooms of the barracks are considered too small; the canteen of the old barracks was enlarged, and the sergeants' mess in the new barracks re-constructed. Coir mattresses were issued to the troops in place of straw. At *Fethard* there was a case of scarlet fever. Water is supplied by hand labour. The health of troops at *Glenbeigh Camp* was extremely good, and both water supply and drainage are reported upon favourably. At *Kilkenny* there were six cases of scarlet fever and one of enteric amongst the men, and one case of scarlet fever amongst the children. Scarlet fever was prevalent in the town. The case of enteric fever was a man recently on furlough. There is a dry-earth system of conservancy, which is said to work admirably. Waterclosets are only used in hospital for special cases. The foul drains are of the old masonry type, and require reconstruction. The surface drainage is also considered defective. The water supply is from a deep well in barracks, and is not liable to pollution. The town, however, has no proper water supply, and water is obtained from surface wells. No hot water is laid on either to the hospital or barrack baths. There is no proper infectious disease ward, and the mortuary is insanitary. At *Kilworth Camp* there was a case of enteric fever, a man recently arrived from Cork. The water supply, from springs, is said to be good and sufficient. At *Queenstown* there was also a case of enteric fever, an officer, the source of the disease being undiscovered. The water supply, from the town waterworks, was at times insufficient, and measures are being taken to obtain a new town water supply. The vicinity of the hospital is insanitary. The hospital drainage was re-constructed during the year; and it is recommended that the fire tank in the mobilisation grounds be connected with the hospital tank. At Fort Carlisle the water supply, from a well, is said to be good and sufficient. At Fort Camden the usual water supply is rain collected in the fort ditch, filtered, and stored in tanks. This runs short in summer and is supplemented by water brought in barrels from springs in the neighbourhood. At Spike Island the water supply is rain water, supplemented by well water. The barracks are considered somewhat dark and gloomy, and the prisoners' room badly heated and ventilated. The married quarters at the end of the cells are reported to be very damp and unhealthy. The surface drainage has been improved, automatic flushing tanks supplied to the officers' mess urinals, and defective drains repaired. It is noted that a water pipe is carried through the manhole of a foul drain. At Haulbowline the drainage is stated to be defective, and reconstruction is necessary. A partial improvement was effected during the year, and four new earth-closets erected. The officers' latrine at Rocky Island requires improvement. At *Kinsale* there were, amongst the men, one case of enteric fever, a man returning from Kilworth Camp, one case of scarlet fever, an arrival from Omagh, and one case of measles, contracted in Charles Fort. Measles was epidemic amongst the children of the garrison, and was very prevalent in the town. Scarlet fever caused only one admission amongst the children. It is noted that there is no proper disinfecting apparatus, mortuary, medical officers' room, or foul linen store at the hospital. The pack and linen store is said to be very damp. The vicinity is not considered sanitary; the barracks are old and the woodwork worn. Urinals are flushed by hand labour. The stables are old and badly ventilated. The married quarters are good, but water is not laid on, and the latrine accommo-

United Kingdom.

dation is considered inadequate. There is a dry-earth system of conservancy, and the water supply, from a well in the barrark square, is said to be good and sufficient. The recreation room and other barrack accessories are considered too small. A new gymnasium was constructed during the year, but the ventilation is reported to be unsatisfactory. A latrine for the school children was also provided. At Charles Fort no water is laid on to the urinals or ablution room. The latter is dark and damp. The surface drainage is defective during heavy rains. The officers' quarters and cells are damp. The latrines, dry-earth system, for the women and children are not considered sufficient. The water supply is rain water supplemented by wells in the Fort. At *Limerick* there were five cases of measles and two of scarlet fever amongst the children, and one case of enteric amongst the men. Scarlet fever was prevalent in the town. Four of the cases of measles were in a family, who had just arrived from India. The case of enteric fever was not traced, but the vicinity of the man's quarters was considered insanitary. It is noted that there is no proper disinfecting apparatus, and that hot water is not laid on to the hospital or barrack room baths. The new barracks were vacated in July and remained unoccupied for the remainder of the year, during the construction of a new drainage system in place of the old masonry drains. New cells are being constructed at the guard room of the new barracks. The prisoners' room is said to be badly lighted and ventilated. Coir mattresses were issued during the year. At *Templemore* it is noted that there is no isolation ward or mortuary at the hospital; the drainage system is old, and no hot water is laid on to baths. The guard room cells are damp and in disuse. The earth closets acted admirably, and the water supply, from an artesian well, is satisfactory. There was no epidemic disease. At *Tipperary* there was a case of enteric fever among the officers. The town water supply from springs in the Galtee mountains was laid on to the barracks, and the well formerly used closed. The latrines, with the exception of the hospital and commanding officers' quarters, are on the dry-earth system. They are not considered satisfactory, and in the officers' quarters are said to be a positive nuisance, as the contents have to be carried downstairs and out by the front door or through the kitchen. It is also noted that the dry-earth closets and urinal in connection with the serjeants' mess are in close proximity to the kitchen and bar, and, in hot weather, become very objectionable. A water system is recommended now that there is an abundant water supply laid on to barracks. During the year a latrine was constructed for the school children. The accommodation for families is insufficient. There was temporary overcrowding of barracks to a slight extent during the year. At *Tralee* there was a case of scarlet fever amongst the children. The dry-earth system is considered good. No hot water is laid on to the hospital bath. The canteen accommodation is considered too small. At *Waterford* there was a case of measles. There is no hot water for the baths. The lighting by gas is poor. The ventilation of the cells is insufficient, and there are no means of heating the prisoners' room. At *Youghal* there was no epidemic disease. The water supply is unsatisfactory, and it is recommended that the new municipal water, which is pure and abundant, should be laid on to barracks. The surface drainage is considered defective, and the dry-earth closets are reported to act badly in consequence of the seats getting clogged.

Curragh District.

The Senior Medical Officer (Brigade-Surgeon-Lieut.-Colonel H. J. W. Barrow) reports that, although there was a considerable decrease during the year in the invaliding and mortality rates, other statistical rates remained fairly stationary or experienced a slight increase. The general health was, however, very good, the prevalence of zymotic disease being slight. There were seven cases of enteric fever, including one officer. One of the cases contracted the disease in a village near the Curragh, another on works at Arthgarvon, another subsequent to manœuvres in Kilkenny. The case amongst officers

United Kingdom.

was apparently contracted in Island Bridge Barracks, Dublin. One of the cases was a man who had been two months in hospital for another disease, and no cause could be assigned for this or for the remaining two cases. Scarlet fever was prevalent amongst the civil population in the vicinity; at the Curragh, 6 men, 1 woman, and 5 children were attacked, and at Newbridge 2 men and 3 children. Diphtheria accounted for two admissions amongst the men, one at the Curragh and the other at Newbridge, and two amongst the children. The origin of the disease was not traced. There were three cases of measles, all at the Curragh. The troops in the right wing of the Curragh are quartered in old wooden huts, the cubic space of which is said to be insufficient. The latrines, except at the hospital, where there are waterclosets, are on the dry-earth system, old and constantly needing repair. The water supply is from a deep well and is filtered at the reservoirs. It is said to be pure though very hard, but is apt to fail during drought. In the left wing the new barracks are nearly completed and a portion of the new cavalry barracks was occupied in February. The old huts are unsatisfactory. The ablution rooms are said to be damp and cold and no hot water is laid on. The brick buildings occupied by the married soldiers are good, but the huts are said to be draughty and in some cases overcrowded. The Senior Medical Officer strongly recommends that drying rooms be provided in all the barracks for troops returning wet from route marching or manœuvres. He also considers the drainage system unsatisfactory in some respects, namely, in the absence of a concrete bed, and of inspecting pits at the junction of the branches, and states that the drains from the wards are not disconnected. At Newbridge it is stated that the surface drainage of the roads needs improvement, and that the supply of fuel for the hospital is not sufficient to allow of hot water baths being provided on more than two days in the week. There is also no hot water laid on to ablution rooms, and the latter are considered to be inconveniently situated in the permanent barracks. The married quarters are insufficient, and some families are on the lodging list. This, however, will be remedied, it is stated, when the Cavalry regiment is moved to the Curragh.

III.—ON THE HEALTH OF THE TROOPS SERVING IN THE MEDITERRANEAN.

Sickness and Mortality.

Gibraltar.

I.—GIBRALTAR.

The average strength of the warrant officers, non-commissioned officers and men serving in the Command during the year was 4,630.

The troops stationed in Gibraltar throughout the year were Nos. 14, 15, 21, 22, and 23 Companies of the Eastern Division, Royal Artillery; 4 Companies of the Royal Engineers; the 1st Battalions of the South Wales Borderers and Cameron Highlanders; and detachments of the Army Service Corps, Medical Staff Corps, Army Ordnance Corps, and Garrison Staff.

Arrivals during the year consisted of the 1st Battalion Northumberland Fusiliers, and a detachment of the 2nd Battalion Dorsetshire Regiment from England in October, and Nos. 2 and 36 Companies of the Southern Division, Royal Artillery, from Malta in November.

Nos. 5 and 17 Companies, Eastern Division, Royal Artillery, and the 1st Battalion West Yorkshire Regiment, left the Command in October for Malta and Hong Kong respectively.

The following table shows the more important statistics of sickness and mortality among the troops forming the garrison:—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
4,630	3,239	17	2	19	30	19	246·74	699·5	4·10	6·48	4·10	53·29

Comparing the above with a similar table for the previous year it is observed that the admission rate has declined by 131·8, and the constantly sick rate by 5·83, while the death rate has increased by ·26 per 1,000. In comparison with similar average ratios for the preceding ten years the admission and mortality rates are lower by 22·6 and ·40 respectively, but the constantly sick rate is higher by 7·09 per 1,000.

The average sick time to each soldier was 19·50 days, which is shorter than in 1895 by 2·08, but longer than the decennial average period by 2·64 days. The average duration of each case of sickness, 27·88 days, is longer in the two comparisons by 1·92 and 4·53 days respectively.

In Abstract XXV is a table giving the more important of the health statistics of the several regiments and corps which served at Gibraltar during the year. It will be seen that the highest admission rate in the Royal Artillery (excluding the two companies from Malta, which were barely two months at the station)

Gibraltar.

was 826·1 in No. 14 Company, Eastern Division, and the lowest, 471·8, in No. 21 Company. The highest rate of constant inefficiency through sickness was 63·46 per 1,000 in No. 23 Company, and the lowest, 31·62, in No. 21 Company, the ratios of admission and constantly sick for the Royal Artillery as a whole being 633·4 and 51·07 per 1,000. In the Royal Engineers the corresponding ratios were 416·7 and 22·17, and in the Infantry 769·0 and 59·13 per 1,000 respectively. Excluding the detachment of the 2nd Battalion Dorsetshire Regiment, the highest admission ratio in any battalion was 1018·0 in the 1st Northumberland Fusiliers, and the lowest, 600·4 per 1,000, in the 1st Cameron Highlanders. The highest constantly sick rate was 84·00, in the 1st West Yorkshire Regiment, and the lowest 46·06, in the Cameron Highlanders.

With reference to the influence of age on the sickness and mortality it is found that among men under 20 years of age the admission ratio was 756·4 per 1,000, rising to 912·6 among those between 20 and 25 years, but falling to 439·9 among men between 25 and 30, and to 406·0 among men of 30 years of age and upwards, the sequence being similar to that observed in the preceding year, when, however, the ratios were generally higher. There was 1 death, or 3·21 per 1,000, among men under 20 years of age, 8 deaths, or 3·37 per 1,000, among men between 20 and 25, 5, or 3·23 per 1,000, among those between 25 and 30, and 3 deaths, or, 7·52 per 1,000, in men of more than 30 years of age. In 1895 the corresponding ratios were 3·45, 4·86, ·79, and 5·33 respectively. With regard to service in the Command, the admission ratio was highest, 927·5 per 1,000, among men in their first year, falling to 764·3 among those in their second, and 390·1 among those in their third years, but rising to 460·3 per 1,000 among men of more than three years of service. Similar results obtained in 1895. Mortality was at the rate of 5·31 per 1,000 among men in their first year, dependent upon 6 deaths; there were also 6 deaths among those in their second year, or 3·01 per 1,000; one death, or 2·75 per 1,000, amongst men in their third year; and 4 deaths, or 3·49 per 1,000, among men who had been more than three years in the Command. The corresponding ratios for the previous year are 3·52, 4·23, 1·93, and 4·42 respectively.

In Abstract No. II. is a table showing the principal statistics of sickness and mortality arranged according to the several groups and orders of diseases.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.—Eruptive fevers* were represented by two cases of scarlet fever.

There were 8 admissions for *enteric fever* with 2 deaths, the ratios being 1·7 and ·43 per 1,000 respectively.

In 1895 these ratios were 2·6 and ·85 and, for the decennial period, 9·1 and 1·56 per 1,000; the year under review thus comparing very favourably with previous years.

The per-centage of mortality to attacks was 25·0, as compared with 33·3 in the previous year, and 17·1, the average per-centage. Two of the cases came from the South Barracks, but one of the men had lived at North Front Hutments until two days previously, and probably contracted the disease there. Two cases came from Grand Casemates Barracks, and one each from Buena Vista, Europa, Town Range, and the Station Hospital. In the second case from South Barracks it is thought probable that the disease was contracted before arrival from England, and in that which occurred at the Station Hospital the man belonged to the Medical Staff Corps and probably became infected while nursing patients suffering from enteric fever. Seven of the eight cases occurred in men between 20 and 24 years of age.

It is stated that while in one or two instances minor defects in the drainage were discovered in or near the barracks from which the men came, and which were promptly remedied, in none of the cases can the origin of the disease be traced with certainty to any definite cause in barracks.

Simple Continued Fever gave 52 admissions, or a ratio of 11·2 per 1,000, which is less than that for the preceding year by 7·3, and than the decennial average rate by 14·4. Nineteen of the cases came from Grand Casemates Barracks, the remainder being fairly equally distributed throughout the garrison.

Gibraltar.

The duration of the cases was as follows:—

Duration.	Number of Cases.
Under 1 week	11
1 and under 2 weeks	11
2 „ 3 „	12
3 „ 4 „	3
1 „ 2 months	13
2 months and over	2
Total	52

The admissions according to months were 8 in October, 7 in April, and 6 each in May, June, and July. It is stated that nearly three-fourths of the cases occurred in men of between 20 and 24 years of age.

Dysentery was the cause of 2 admissions as against 4 in the preceding year. *Other diseases* of the 1st sub-group included a single case of diphtheria, and 86 admissions for influenza, there being only 2 cases of the latter disease in 1895.

Malarial Fevers.—There were 67 admissions, all for ague, occurring mostly in men of the 22nd and 23rd Companies, Eastern Division, Royal Artillery, from India and Aden respectively. The ratio of prevalence, 14·5 per 1,000, is less than that for 1895 by 10·2, but exceeds the decennial average ratio by 10·9.

Under the heading of *Septic Diseases* there were 3 admissions for erysipelas.

Venereal Diseases.—*Primary syphilis* was the cause of 27 admissions, or 5·8 per 1,000, as compared with 8·1 in 1895. If to this be added the sickness from simple venereal ulcer, for which there were 302 admissions, and 38·16 constantly sick, the total admission ratio for primary venereal sores equalled 71·1 per 1,000, which is less than in the previous year by 72·8, and than the average for the preceding ten years by 48·0. *Secondary syphilis*, with 97 admissions, gave a ratio of 21·0 per 1,000 as compared with 29·6 in 1895, and with 27·2 for the decennial period. *Gonorrhœa* caused 655 admissions, or a ratio of 141·5 per 1000, which is less than the previous year's rate by 1·4, but greater than the average by 18·6. Taking all these forms of venereal disease together, the total admission rate was 233·6 per 1,000, which compares favourably with 316·4 in the previous year, and with 269·2, the decennial average rate. The total ratio of constant inefficiency on account of these diseases was 25·69 per 1,000, which is lower than in the previous year by 5·96, but is 4·12 in excess of the average.

Parasitic Diseases.—13 admissions for tænia solium are recorded.

For *Alcoholism* there were 30 admissions, including two of delirium tremens, the ratio, 6·5 per 1,000, being higher than in 1895 by 2·7, and than the average rate by 1·3.

Debility caused 21 admissions, the equivalent ratio, 4·5 per 1,000, being less than the previous year's rate by 1·2, and than the decennial average by a fraction.

Rheumatism.—94 cases are recorded, including one of rheumatic fever, the equivalent ratio being 20·3 per 1,000, which is below the ratio for the preceding year by ·8, and the decennial average by 9·0.

Tubercular Diseases caused 8 admissions, of which 5 were cases of tubercle of the lung. There were 3 deaths, all from tubercle of the lung, two being invalids who had left the Command. The admission ratio, 1·7 per 1,000, is below the rate in 1895, and also below the decennial average, in the former instance by ·6, and in the latter by ·3.

Other Diseases of Group D. caused 35 admissions, including 25 for non-malignant new growth, 8 for anæmia, and two for diabetes mellitus.

Gibraltar.

Local Diseases.—*Diseases of the Nervous System.*—There were 71 admissions, including 13 for mental affections, and two deaths are recorded. The admission rate equalled 15·3 per 1,000, as compared with 10·1 in the previous year and 7·3 the decennial average rate. The cases comprised 46 of neuralgia, 8 of melancholia, 6 of epilepsy, 5 of vertigo, 2 each of dementia and idiocy, 1 of inflammation of the cerebral membrane, and 1 of mania, the last two cases proving fatal.

Diseases of the Eye with 38 cases gave an admission rate of 8·2 per 1,000, which is below the previous year's rate and the average by 1·6 and 2·8 respectively. Conjunctivitis alone furnished 22 of the admissions.

Diseases of other Organs of Special Sense caused 47 admissions, or a ratio of 10·2 per 1,000, which is less than the previous year's rate by 2·4, but greater than the decennial average by 1·5. Inflammation of the external meatus caused 32 of the admissions.

Diseases of the Circulatory System.—There were 17 admissions and 3 deaths. The ratio of prevalence was 3·7 per 1,000, or 1·2 higher than in 1895 and a fraction below the decennial average rate. The cases included 11 of palpitation and 4 of valvular disease of the heart; two deaths occurred from the last-named disease, the third death being due to fatty degeneration of the heart.

Diseases of the Respiratory System.—102 admissions are recorded, the equivalent ratio being 20·0 per 1,000, as compared with 37·5 in the previous year, and with 28·1, the average for the preceding ten years. Bronchial affections accounted for 84 of the cases, and there were 7 admissions for asthma and 6 for pneumonia. Two deaths are returned under this heading, both due to pneumonia.

Diseases of the Digestive System caused 433 admissions, or a ratio of 93·5 per 1,000, which is below that for the previous year by 14·0, but above the average rate by 7·4. Among the cases treated were 208 of affections of the mouth and throat, 60 each of dyspepsia and colic, 43 of diarrhœa, and 24 of hepatic disorder. There was one death from peritonitis.

For diseases of the *lymphatic and glandular system* there were 73 admissions, or 15·8 per 1,000, which is lower than in 1895 by 8·7, but higher than the average rate by 3·2. All were cases of inflammation or suppuration of the lymphatic glands.

Diseases of the Urinary System caused 9 admissions, equal to a ratio of 1·9 per 1,000, which is below the previous year's rate by ·7, but above the average by ·3. Incontinence of urine caused 6 of the admissions, and acute nephritis 2, and there was one fatal case of Bright's disease.

Diseases of the Generative System with 354 admissions gave a ratio of 76·5 per 1,000, as compared with 154·8 in the previous year, and 104·3, the decennial average rate. In addition to the 302 cases of simple venereal ulcer previously referred to, there were, among the remainder, 28 cases of orchitis, 6 each of balanitis and varicocele, and 2 of hydrocele. There was one death from extravasation of urine.

Diseases of the Organs of Locomotion.—There were 28 admissions and one death. The ratio of sickness was 6·1 per 1,000, which is less than that for the previous year by 1·4, but above the average by ·5. Synovitis accounted for 15 of the cases, and there were 3 cases each of inflamed bursa and periostitis among the remainder. The death was due to caries of the spine.

Diseases of the Connective Tissue caused 92 admissions, or a ratio of 19·9 per 1,000, which is less than the previous year's rate by 5·0, but a fraction above the average. Of the cases, 36 were due to inflammation and 56 to abscess.

Diseases of the Skin, with 209 admissions, gave a ratio of 45·1 per 1,000, as compared with 55·9 in the preceding year and 46·4 the average rate. Eczema, ulcers, boils, whitlows, and itch were the most frequent causes of admission.

Injuries.—There were 544 cases of local injury, the ratio, 117·5 per 1,000, being above that recorded in 1895 by 17·7 and above the average by 14·9. The principal causes of admission were wounds (191), sprains (118), contusions (100), abrasions (86), and fractures (27); there were 3 deaths, two of which were cases of suicide, one by gunshot wound from a Lee-Metford rifle and the other by cut throat. In the first case the court of inquest was of opinion that

Gibraltar.

"there was no evidence to show that he was not of sound mind at the time, "but that he was known to have been suffering pain," and in the second case the verdict was "temporary insanity induced by drink." No motive could be assigned in either instance. The third death was the result of an accident on Christmas eve, when, during some blasting operations in an adjacent quarry, a large piece of rock crashed through the roof of the canteen at Catalan Bay, injuring several men, one of whom died on the following day from concussion of the brain.

Invaliding.—The number of invalids sent home during the year was 30, the equivalent ratio being 6·48 per 1,000, which is below that for the previous year by 7·80, and less than the average rate for the preceding ten years by 10·79. This large decrease is, however, accounted for by the fact that there were 20 invalids in hospital awaiting passage to England who did not embark till 1897.

Among separate corps and excluding those whose average annual strength did not exceed 100 men, the highest invaliding rate was 22·35 per 1,000 in No. 23 Company, Eastern Division, Royal Artillery, the next highest being 14·49 in No. 14 Company of the same Division. No man was sent home from the 15th Company, Eastern Division, Royal Artillery, or from the 1st Battalion Northumberland Fusiliers. Excluding these units, the lowest rates were 2·97 per 1,000 in the 1st Battalion South Wales Borderers and 2·98 in the Royal Engineers. Invaliding according to age occurred as follows:—3 men, or 9·62 per 1,000, were under 20 years of age, as compared with 10·36 in the previous year; 14 men, or 5·91 per 1,000, were between 20 and 25, as compared with 15·38 in 1895; 9 men, or 5·81 per 1,000, were between 25 and 30, as against 14·23 in 1895; and 4 men, or 10·03 per 1,000, were more than 30 years of age, the corresponding ratio in 1895 being 16 00. With regard to invaliding according to length of service in the Command, 3 men, or 1·51 per 1,000, were in their second year, 5, or 13·74, in their third year, and 22 men, or 19·21 per 1,000, had been more than three years in residence. No men were invalided home who had been less than one year abroad. In the previous year, the highest ratio, 16·93 per 1,000, occurred among men in their second year and the lowest, 13·29, in men with less than one year's service in the Command. The principal causes of invaliding were, nervous affections, 4 cases, or ·86 per 1,000 (including 2 cases, or ·43 per 1,000, of mental affection), tubercular disease of the lung 3 cases or ·65 per 1,000, affections of the heart 4 cases, or ·86 per 1,000, and diseases of the respiratory system 5 cases, or 1·08 per 1,000.

There were 19 men discharged the service as medically unfit, the ratio, 4·10 per 1,000, being lower than that in 1895 by 8·27, and than the average rate for ten years by 4·44. The chief disabilities necessitating discharge were, diseases of the respiratory system, 5 cases, or 1·08 per 1,000, diseases of the circulatory system, 4, or ·86, and tubercular affections 3 cases, or ·65 per 1,000.

Officers.—The average strength was 138, and there were 71 cases of sickness. The ratio of admission was 514·5 per 1,000, as compared with 485·3 in the previous year. No death occurred, but 7 officers were invalided, viz., one each for enteric fever, simple continued fever, leucocythemia, paralysis, fracture, dislocation, and ulcer. Among the cases treated were 12 of simple continued fever, 2 of enteric fever, 5 of sore throat, 4 of diarrhœa, and 15 of injuries, and one officer was attacked with small-pox of a mild type. The last-named disease was very prevalent in the neighbouring Spanish town, and the officer attacked was stationed in the North Front hutments adjoining Spanish territory.

Both the officers attacked with enteric fever were between 22 and 23 years of age; one of them lived in the officers' quarters, Grand Casemates Barracks, and a careful investigation did not reveal anything to account for the attack. The second officer lived in the officers' quarters, Moorish Castle, and here the drainage, milk, and water supply, &c. were found to be good. This officer shortly before the attack had been on a fishing expedition into Spain, and may possibly have contracted the disease there.

Women.—In an average strength of 264 there were 175 cases of sickness and 1 death. The ratio of sickness was 662·9, and that of mortality 3·79 per 1,000, as against 647·5 and *nil* in the preceding year. The chief cause of sickness was debility, which gave 20 cases, while there were 11 admissions each for rheumatism and bronchial affections, 21 for diseases of the mouth and throat, 8 for inflammation of stomach, and 7 each for influenza and simple continued fever. One woman contracted small-pox; she was in the habit of sending the family washing to Linea, in Spanish territory, where the disease was prevalent, and it is thought that the infection was probably introduced in this way. A general order was published pointing out the danger of sending washing to Spain. The fatal case was one of carcinoma.

Children.—The average strength was 516. There were 397 cases of sickness and 10 deaths. The admission and mortality ratios were 769·4 and 19·38 respectively, the former being lower than that for 1895 by 136·7 and the latter higher by 22·77. Bronchial affections caused 65 cases, and there were, among the remainder, 41 admissions for chicken-pox, 31 for diarrhœa, 27 for debility, 24 for eczema, and 18 for simple continued fever. A fatal case of small-pox is recorded in the infant child of the woman referred to in the preceding paragraph, the child having been born immediately after the development of the disease in the mother. Of the other deaths, 2 were due to debility, 2 to bronchitis, and one each to congenital malformation of heart, tubercle, teething, inflammation of stomach, and diarrhœa.

Vaccination and Small-pox.—There were 3 cases of small-pox in the Command during the year, one officer, one woman, and one child. The last case terminated fatally. There were 10 primary vaccinations, arm to arm, amongst the children, all being successful. Of 10 arm-to-arm re-vaccinations amongst the men and 8 amongst the women, 5 of the former were failures. Of 80 primary vaccinations with preserved lymph amongst children, 36 were failures. There were 69 re-vaccinations with preserved lymph amongst the men, of which 23 were failures; 18, with 5 failures, amongst women, and 9, all failures, amongst children.

Sanitary Conditions.—A new system of drainage, having its outfall at Europa, is in course of construction. The Admiralty and other works, at present being carried out, have led to a great influx of civil labour from the neighbouring Spanish towns, and this fact favours the introduction of infectious and contagious diseases. The Principal Medical Officer, Surgeon-Colonel W. A. Catherwood, M.D., notes that the khaki clothing is unsuitable for the climate of Gibraltar during winter, unless warm underclothing is worn. He also states that, in consequence of the great prevalence of venereal disease, a Contagious Diseases Act is much required.

In the North Front district it is noted that some of the huts require to have the soil underneath covered with concrete and surface drains constructed around them. The commanding officer's hut is specially mentioned as being damp, and the floor requires raising. Sand is provided for the dry earth closets, and this is considered useless. Charcoal filters for the various guard-rooms and huts are also considered objectionable. A new lavatory for the officers' mess, coal and oil store for the non-dieted hospital, a new telegraph hut, and a large water tank for medical officers' quarters were constructed during the year. The barrack square at Catalan Bay was covered with concrete, and the general sanitary condition there considered satisfactory. At the Grand Casemate Barracks alterations are being made for the introduction of electric light. The whole of the drainage was overhauled, and all the drains in the backyard reconstructed. A new staff-sergeants' quarter was completed and occupied, and the flooring of some of the barrack rooms renewed. It is recommended that the yards paved with cobble stones be covered with asphalte or concrete. The Orange Bastion Barracks are noted as being old and badly lighted and ventilated. At Poca Roca one of the huts is old and dilapidated. It was repaired during the year and a cookhouse constructed. A large tank was also constructed to supply water to Poca Roca and Bruce's Farm. The Moorish Castle Barracks and married quarters of the district are considered satisfactory. King's Bastion was vacated by 15th Company, Eastern Division, Royal Artillery, on the 28th June, and handed over for the electric lighting works. The married quarters there are considered unhealthy, and the latrines are badly placed and unsatisfactory. The Wellington Front Barracks are, owing to construction, dark, damp, and ill-ventilated, and liable to be pervaded with odours from sewage in the seawater outside.

Gibraltar.

A new canteen and coffee bar were constructed by altering three of the rooms. The drains were reconstructed in the officers' quarters, Town Range, and partial repairs effected in the drains of the South Block of the barracks. The barracks occupied by the Royal Engineers were considered to be in good sanitary condition, with the exception of the tailors' shop, which is low and badly ventilated. The drain of the Convent Guard was reconstructed. In the South Barracks the kitchen and latrines are said to be very old. The drainage from the commanding officers' quarters and officers' mess was reconstructed, and some buildings obstructing ventilation are to be removed. The drainage of married quarters in Rodger's Road is considered defective. The space between North Jumper's Bastion and the breakwater, containing foul stagnant water, was filled in, and the canteen of the bastion enlarged. At Windmill Hill the drains of several buildings were reconstructed and improvements effected in latrines and waterclosets. The drains and latrines of the Buena Vista infant school were also reconstructed, an underground tank filled in and an iron tank erected in its place. Similar improvements were effected in the drainage and latrines generally of the Buena Vista Barracks. A cook house and ablution room were added to St. Michael's hut. At Europa the entire system of drainage of the Defensible Barracks and Commanding Officer's quarters, Royal Artillery, was reconstructed, a new canteen and recreation room building was partially completed, and other improvements have been effected. The main drain from Windmill Hill to Europa is considered defective in parts, and, amongst minor requirements, it is noted that the schoolroom and sergeants' mess require enlarging, and that the medical inspection room is unsatisfactory. The station hospital accommodation is insufficient, and additional baths, latrines, and waterclosets are required. The accommodation has to be supplemented by marquees and bell tents, and by two non-dieted hospitals, one of 150 beds in Town Range and another of 13 beds at the North Front. Disinfection by steam is carried out by the civil authorities at the colonial hospital, there being no apparatus for military purposes.

Malta.

II.—MALTA.

The average strength of the troops stationed in Malta (excluding the Royal Malta Artillery) was 8,316, and the units serving throughout the whole year were the following:—

Nos. 8, 16, 22, 26, 29, and 30 Companies, Southern Division, Royal Artillery, three companies of the Royal Engineers, the 1st Battalions of the Royal Lancaster, Royal Warwickshire, and Lincolnshire Regiments, the 2nd Battalion Worcestershire Regiment, and the 1st Battalions of the West Riding Regiment and the Highland Light Infantry, with detachments of the Army Service, Medical Staff, Army Ordnance, and Army Pay Corps, and Garrison Staff.

The arrivals were: Nos. 5 and 17 Companies, Eastern Division, Royal Artillery, from Gibraltar early in November, and the 2nd Battalion Royal Welsh Fusiliers from England in July. The troops leaving the Command were Nos. 2 and 36 Companies, Southern Division, Royal Artillery to Gibraltar on 2nd November, and the 2nd Battalion King's Royal Rifle Corps to South Africa in July.

Below is given a table showing the more important of the statistics of sickness and mortality among the troops during the year:—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
8,316	6,602	62	4	66	178	68	433·52	793·9	7·93	21·40	8·18	52·13

Malta.

Comparing the above with a similar table in the report for 1895, an increase of 22·4 is observed in the admission rate, and of 1·06 in that of mortality, but the constantly sick rate has declined by 1·04 per 1,000. An increase of 138·3, ·48, and 8·61 per 1,000, has occurred in these ratios respectively as compared with the decennial period rates.

The average sick time to each soldier was 19·08 days, which is shorter than in 1895 by ·32 of a day, but longer than the average period for the preceding ten years by 3·20 days. The average duration of each case of sickness was 24·03 days, shorter than in the previous year by 1·12, and fractionally less than the average.

The more important of the statistics of sickness in the different corps which served in the Command are given in Abstract XXV. In the Artillery, the admission, mortality, and constantly sick rates were 554·9, 7·70, and 40·53 per 1,000 respectively, as compared with 715·7, 6·16, and 52·74 in 1895. Excluding the two companies which arrived in November, the highest admission rate was 733·8 in No. 36 Company, Southern Division, at Fort Tigne and in hutments, for ten months prior to embarking for Gibraltar. The next highest rate was 702·1 in No. 8 Company, stationed for 10 months of the year at Fort St. Elmo and St. James Cavalier, and for the remaining two months at Fort Ricasoli. The lowest ratios were 316·4 in No. 16 and 398·8 in No. 22 Company, both at Fort Ricasoli during the whole year. The constantly sick rate was highest in No. 8 Company, viz.: 54·52 per 1,000. No. 26 Company at Fort Tigne and in hutments, gave a ratio of 54·12; and the lowest rates were 21·84 and 27·92 in Nos. 16 and 22 Companies at Fort Ricasoli. In the Infantry the admission rate was 882·9, the death rate 8·10, and the constantly sick rate 57·35 per 1,000, as compared with 811·0, 6·58, and 55·01 respectively in 1895. The highest admission rate was 1418·4 in the 2nd Battalion Royal Welsh Fusiliers, quartered at Verdala barracks, after arrival from England in July, the next highest being 1094·4 in the 1st Battalion West Riding Regiment, who were for one half of the year at Verdala, and for the other at Floriana and Nôtre Dame. The 2nd Battalion King's Royal Rifle Corps, which left for South Africa in July, gave the low rate of 486·7 per 1,000, and was quartered at Floriana and Nôtre Dame, the next lowest rate being 730·9 in the 1st Battalion Lincolnshire Regiment at Lower St. Elmo. The highest death rate was 14·39 per 1,000 in the 2nd Battalion Worcestershire Regiment in the Isola district, the next highest being 13·56 in the 1st Battalion Highland Light Infantry at Manoel forts and huts. In the 2nd Battalion King's Royal Rifle Corps the death rate was 1·89 per 1,000, and in the 1st. Battalion West Riding Regiment 2·15. The highest rate of constant inefficiency was 66·92 per 1,000 in the 1st Battalion West Riding Regiment, followed by 63·05 in the 2nd Battalion Royal Welsh Fusiliers, the two lowest ratios being 44·47 in the 1st Battalion Royal Warwickshire Regiment at Pembroke Camp and Gozo, and 47·35 in the 2nd Battalion King's Royal Rifle Corps.

With reference to the influence of age on the sickness and mortality, it is observed that the admission rate was 917·2 per 1,000 among men under 20 years of age, rising to 923·5 among men between 20 and 25, then falling to 509·4 among those between 25 and 30, and to 311·6 among men of 30 years of age and upwards, a sequence of ratios which has occurred for several years. The death rates at the various age periods named were 6·44, 8·55, 4·58, and 8·80 per 1,000 respectively; in the preceding year the highest death rate was also among men of 30 years of age and upwards, and the lowest among those between 25 and 30 years.

With regard to service in the Command, the admission rate was highest among men in their first year, namely, 924·9 per 1,000, declining to 724·1, 617·9, and 409·1 among those in their second, third, and fourth years respectively, and to 331·9 among men who had been more than four years in residence. The same order was observed in the previous year with the exception that the admissions amongst men in their third year were higher than among those in their second year. The rate of mortality was highest, 8·60 per 1,000, among men in their second year, followed by 8·26 among men in their fourth, by 7·48 among men who had been less than one year in the Command, and by 7·14 among those in their third year, the lowest ratio, 2·89 per 1,000, being among men of four years' service and upwards. In the preceding year the highest death rate was amongst men in their third year and the lowest amongst those in their fourth year.

Malta.

The principal statistics of sickness and mortality arranged according to the several groups and orders of diseases are set forth in Abstract III.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—Under the heading of *eruptive fevers* are recorded 4 cases of scarlet fever and 2 of cow-pox. There was one death from scarlet fever.

Enteric fever.—There were 49 admissions and 20 deaths, equal to ratios of 5·9 and 2·41 per 1,000 respectively, the former being 3·1 above the corresponding rate for the previous year, but fractionally below the average for the ten years 1886–95, while the latter is higher in both comparisons, by 1·20 and ·24. The per-centage of deaths to attacks was 40·8, as compared with 43·5 in 1895, and with 34·7, the decennial average. The incidence of the attacks according to age was as follows:—7 in men under 20 years, 7 in men in their 21st year, 6 each in men in their 22nd and 23rd years, and 5 in men in their 24th year, while 18 of the cases were among men 24 years of age or upwards. As to total service, 4 of the men attacked were in their first year, 12 in their second, 7 in their third, 9 in their fourth, 6 in their fifth, and 11 had more than five years' service; 21 had been less than one year in the Command, 20 were in their second year, 3 in their third, and 5 in their fourth year. There were three cases during the first quarter of the year, 12 during the second, and 17 cases each during the third and fourth quarters of the year. At Fort Manoel and the hutments, 11 cases, with 2 deaths, occurred in the 1st Battalion Highland Light Infantry, 9 in May, 1 in July, and 1 in November. The outbreak in May was of a very severe type, and was attributed solely to a contaminated milk supply. The cows from which the milk was obtained were kept in two filthy yards, and watered from a well in one of them. The water on being subjected to analysis was found to be much polluted. The huts and tents occupied by the companies attacked were vacated and thoroughly overhauled and the drainage relaid. Nine cases, all of a severe type, occurred in the 1st Battalion Royal Lancaster Regiment at Imtarfa Barracks, which were occupied for the first time during the year under report. The disease appeared in July, during which month there were 2 cases, followed by 2 in August, 1 in October, and 4 in November, but it is stated that no cause could be assigned for any of them. 5 deaths occurred. At Pembroke Camp and vicinity there were 5 cases and 3 deaths, one of the cases being associated with defective drainage. One case from Upper St. Elmo was in a man who had only arrived from Gibraltar two days previously, and who obviously contracted the disease before arrival in Malta. The remaining 23 cases, amongst which there were 9 deaths, were distributed generally over the remainder of the military districts, no cause being discovered in barracks that would account for their appearance.

Simple Continued Fever caused 1,572 admissions and 15 deaths. The admission rate, 189·0 per 1,000, is higher than that for the previous year by 20·0, and than the ten years' average rate by 69·1, while the death-rate, 1·80 per 1,000, is also higher by ·23 and ·70 respectively. There was an average constant sickness of 110·18 men, equal to a ratio of 13·25 per 1,000, as compared with 13·14 in 1895, and with an average rate of 9·53. As in the year preceding, there was a large number of recently arrived men in the garrison, no less than 4,542 men having less than one year's service in the Command, and the high admission rate for this affection is attributed to this fact.

For *dysentery* there were 44 admissions, or a ratio of 5·3 per 1,000, as compared with 5·4 in 1895, and 4·4, the average ratio for the ten years 1886–95. The attacks were generally mild and soon yielded to treatment; no death occurred. At Gozo, where there were 27 admissions in the previous year. attributed to a limited and polluted water supply, only one admission occurred, and the disease in this case was a relapse from an attack contracted in Ceylon.

Other diseases of the 1st sub-group were represented by a single case of mumps.

Malarial Fevers caused 179 admissions, the equivalent ratio being 21·5 per 1,000, which is above the previous year's rate and the ten years' average by 7·5 and 10·4 respectively. There were 172 cases of ague, one of remittent fever, and 6 of malarial cachexia; 116 of these cases occurred in the 1st Battalion Royal Lancaster Regiment, which had received a large draft from India in February. There was no death.

Under the heading of *Septic diseases* 2 admissions for erysipelas are returned.

Venereal Diseases.—For *primary syphilis* there were 394 admissions, or a ratio of 47·4 per 1,000, which is above the previous year's rate and the average ratio for the preceding ten years by 21·2 and 29·4 respectively. If to this be added the sickness from simple venereal ulcer, which caused 106 admissions and an average constant sickness of 10·08 men, the total admission rate for primary venereal sores was 60·1 per 1,000, as compared with 34·3 in 1895 and with 42·2 during the decennial period. The constantly sick rate was 5·73 per 1,000, as against 4·01 and 3·85 in the two comparisons. *Secondary syphilis*, with 135 admissions, gave a ratio of 16·2 per 1,000, which is below the previous year's rate by 6·0, but above the average for the ten years 1886–95 by ·9; the constantly sick rate, 1·89 per 1,000, was also lower in the first comparison by 1·22, but higher than the average by ·19. There were 2 deaths, one being that of an invalid who had left the Command. For *gonorrhœa* there were 810 admissions, the ratio per 1,000 being 97·4, which is in excess of the rate for 1895 and the average for ten years by 19·4 and 29·7 respectively. The constantly sick rate was 7·39 per 1,000, also higher in the two comparisons by 1·18 and 2·46. Taking all forms of venereal disease together, the total admission ratio was 173·7 per 1,000, which is above the previous year's rate by 39·2 and the decennial average rate by 48·5, while the constantly sick rate, 15·01 per 1,000, shows an increase of 1·68 and 4·53 when compared with the corresponding ratio in 1895 and with the average.

For *parasitic affections* 5 admissions are returned, four being on account of tænia solium.

There were 10 admissions for *alcoholism*, including one for delirium tremens; the ratio, 1·2 per 1,000, is less than that for 1895 and than the average rate by ·4 and 1·7 respectively.

Debility, &c.—38 cases are recorded, or a ratio of 4·6 per 1,000, as compared with 6·1 in the previous year and 10·2, the average rate.

Rheumatism caused 200 admissions, only one being returned as rheumatic fever, the ratio being 24·1 per 1,000, which is higher than that for the previous year by 2·7, but lower than the average rate by ·7. No death occurred.

Tubercular Diseases gave 8 admissions and 5 deaths, amongst the fatal cases being an invalid who had left the Command. The admission rate was 1·0 and the death rate ·60 per 1,000, both being lower than the corresponding ratios for 1895 by 2·1 and ·12 respectively, and than the average ratios for the preceding ten years by 1·7 and ·28. All the admissions and deaths were due to tubercle of lung.

For *other diseases* of Group D. there were 75 admissions for non-malignant new growth, 13 for anæmia, 2 for scrofula, and 1 for carcinoma, the last proving fatal.

LOCAL DISEASES.—There were 38 admissions for *diseases of the nervous system*, the equivalent ratio being 4·6 per 1,000, which compares favourably with 7·6 in 1895 and with 7·8 per 1,000, the decennial average rate. Among the cases were 10, or 1·2 per 1,000, of mental affection, and the remainder included 17 of neuralgia, 3 of epilepsy, and 3 of paralysis. There were 2 deaths, one each from softening of brain and apoplexy.

Diseases of the Eye, with 98 admissions, gave a ratio of 11·8 per 1,000, which is lower than that for the previous year by 1·0, but higher than the average for the ten years 1886–95 by 1·5. Conjunctivitis was, as usual, the chief cause of admission, 63 cases being recorded, and there were 10 cases of keratitis.

Diseases of other Organs of Special Sense, with 88 admissions, or 10·6 per 1,000, were rather less prevalent than in the previous year, when the rate was 13·7, but the ratio differs but little from the average. Of the cases 70 were due to inflammation of the external meatus, and there were 4 admissions for nasal affection.

Diseases of the Circulatory System.—27 admissions are recorded, equal to 3·2 per 1,000, which is less than the previous year's and the average rates by more than one half. The cases included 12 of palpitation and 11 of valvular disease of the heart, one death occurring from the last-named disease.

Malta.

Diseases of the Respiratory System caused 101 admissions and 5 deaths, one of the latter being that of an invalid. The admission ratio, 12·1 per 1,000, compares favourably with 25·7 in 1895 and with 22·4, the average rate for the preceding ten years. The death rate was ·60 per 1,000, as compared with ·48 in the previous year and ·54, the decennial rate. Nearly three-fourths of the cases were due to bronchial affections, and among the remainder were 8 of pleurisy and 7 of pneumonia. Four of the deaths were due to pneumonia, and the fifth, that of the invalid, to pneumonic phthisis.

Diseases of the Digestive System with 593 admissions and 3 deaths, gave admission and mortality rates of 71·3 and ·36 per 1,000, both lower than the corresponding rates for the previous year and for the preceding ten years, the admission rate by 2·3 and 9·6, and the death rate by ·36 and ·22 respectively. The chief causes of admission were diseases of the mouth and throat 259, diarrhœa 117, hepatic affections 74, dyspepsia 54, colic 41, piles 22. The deaths were one each from ulcer of intestines, internal strangulation, and abscess of liver.

Diseases of the Lymphatic and Glandular System gave an admission ratio of 11·2 per 1,000, which is below that for the previous year by 4·5 but above the ten years' average rate by 3·7. Of 93 cases 85 were admitted for inflammation of the lymphatic glands.

For *Diseases of the Urinary System*, there were 15 admissions, the ratio, 1·8 per 1,000, being above that of 1895 by ·2 but below the average by ·1. Most of the cases were due to incontinence of urine. There were two deaths from Bright's disease.

Diseases of the Generative System caused 225 admissions, or a ratio of 27·1 per 1,000, which is below the previous year's rate and the ten years' average by ·9 and 12·3 respectively. In addition to the cases of simple venereal ulcer there were 53 cases of orchitis, 43 of balanitis, and 12 of hydrocele.

Diseases of the Organs of Locomotion.—53 admissions are recorded. The ratio, 6·4 per 1,000, is below that for 1895 by ·8 but above the average for the ten years 1886–95 by ·5. The cases included 39 of synovitis and 6 of ostitis.

Diseases of the Connective Tissue with 280 admissions, gave a ratio of 33·7 per 1,000, which is higher than that for the previous year and than the average rate by 1·7 and 5·8 respectively.

Diseases of the Skin.—There were 647 admissions, the equivalent ratio being 77·8 per 1,000, which is 12·6 below that for 1895 but 30·4 above the decennial average rate. Among the cases were 182 of boils, 171 of eczema, 135 of itch, 59 of whitlow, and 42 of ulcer.

Poisons.—Of 8 admissions 3 are recorded as due to alcoholic poisoning, the remainder being cases of poisoned wound.

Injuries caused 750 admissions. General injuries were represented by 5 cases of multiple injury, of which one proved fatal, and there was also a death out of hospital from this cause, the man being killed by a fall from a roof. Two deaths from accidental drowning whilst bathing are also recorded. Of the 745 admissions for local injury a large proportion was due to wounds, sprains, and contusions, the deaths being 4 in number, due respectively to fracture of skull from fall from a cliff, dislocation of cervical vertebra from diving on to a submerged rock, contusion of abdomen with rupture of spleen from a fall from the ramparts, and compression of brain with fracture of skull caused by a fall from a window. The total admission rate for injuries was 90·2 per 1,000 as compared with 94·4 in the previous year and 88·4 the average for the ten years 1886–95.

Invaliding.—The number of men invalided home during the year was 178, or a ratio of 21·40 per 1,000, which is higher than the previous year's rate and than the average for the preceding ten years by 6·69 and 2·67 respectively. The invaliding rate in the Artillery was 20·29 per 1,000, as compared with 13·10 in 1895, the highest ratio, 36·36 per 1,000, occurring in No. 26 Company, Southern Division, while no man was invalided from No. 8 Company of the same Division. The Royal Engineers gave a ratio of 7·69 per 1,000, which is below the previous year's rate by 3·76. In the Infantry the ratio was 21·96, as against 14·23 in the year before, the ratios of the several battalions ranging from 34·94 in the 2nd Worcestershire Regiment and 32·20 in the 2nd King's Royal Rifle Corps to 4·61 in the 1st Royal Warwickshire Regiment, and 2·63

Malta.

in the 2nd Royal Welsh Fusiliers. Taking the ages of the men sent home it is found that 17, or 15·64 per 1,000, were under 20 years of age, 112, or 22·79 per 1,000, were between 20 and 25, 39, or 22·32 per 1,000, were between 25 and 30, and 10, or 17·61 per 1,000, were 30 years of age and upwards. In the previous year the corresponding ratios were 10·88, 15·39, 13·63, and 20·03 respectively. As regards length of service in the Command, 91 of those invalided, or 20·04 per 1,000, were in their first year, 63, or 24·62 per 1,000 in their second, 8, or 28·57 per 1,000, were in their third, 2, or 8·26 per 1,000, were in their fourth year, and 14 men, or 20·20 per 1,000, had been more than four years in the Command, the corresponding ratios for 1895 being 14·49, 13·28, 17·40, 15·27, and 16·99 respectively. The chief causes of invaliding were simple continued fever 69 cases, or 8·30 per 1,000, as compared with 4·82 in 1895; nervous affections 15 cases, or 1·80 per 1,000, an increase of ·24, (eleven of these cases, or 1·32 per 1,000, were sent home on account of mental disorder), diseases of the circulatory system, 11 cases, or 1·32 per 1,000, a decline of ·37; secondary syphilis and diseases of the respiratory system each 10 cases, or 1·20 per 1,000, as compared with ·72 and ·48 respectively in 1895; and tubercular diseases 9 cases, or 1·08 per 1,000, a decline of ·61.

There were 68 men finally discharged the service as medically unfit, the ratio being 8·18 per 1,000, which is below the rate for 1895 and the average rate for the ten years 1886–95 by ·14 and 2·76 respectively. The principal causes of discharge were diseases of the nervous system 14 cases, or 1·68 per 1,000, a decline of ·25 on the rate in the previous year, (11 cases, or 1·32 per 1,000, being due to mental disease); diseases of the circulatory system 13 cases, or 1·56 per 1,000, as against 1·69 in 1895, and tubercular disease 9 cases, or 1·08 per 1,000, as compared with a ratio of 1·21 in the preceding year.

Officers.—The average strength was 235, and there were 171 cases of sickness, equal to a ratio of 727·7 per 1,000, as compared with 720·3 in the preceding year. There were 3 deaths, and 8 officers were invalided during the year, the mortality ratio being 12·77, and that of invaliding 34·04 per 1,000, as compared with 8·33 and 50·00 respectively in 1895. The cases included 76 of simple continued fever, 16 of injuries, 11 each of hepatic disorders and skin affections, and there were 2 cases of enteric fever, both terminating fatally. In one the disease was associated with a defective blocked drain at Pembroke Camp, but in the other case the officer lived in private lodgings, the sanitary condition of which was reported to be above suspicion. The third death was due to chronic pneumonic phthisis. The causes of invaliding were simple continued fever 4 cases, debility 2, and spasmodic asthma and ulcer 1 case each.

Women.—In an average strength of 425, there were 207 cases of sickness and 4 deaths, the equivalent ratios being 487·1 and 9·41 per 1,000, which are lower than those recorded for 1895 by 138·5 and 16·66 per 1,000 respectively. Among the cases treated were 90 of simple continued fever, 42 of debility, 22 of diseases of the digestive system, 11 of diseases of the generative system, and 7 of rheumatism. Three deaths were due to simple continued fever, and one to hæmorrhage from placenta prævia.

Children.—There were 378 cases of sickness and 37 deaths in an average strength of 735; the equivalent ratios were 514·3 and 50·48 per 1,000, both being lower than corresponding ratios in the previous year by 122·8 and 11·35 respectively. The cases included 78 of simple continued fever, 39 of bronchitis, 43 of diarrhœa, 25 of mumps, 18 each of conjunctivitis, debility, and inflammation of intestines, 15 of eczema, and 10 of sore throat. The deaths were 12 from inflammation of intestines, 6 from bronchitis, 6 from debility, 4 from simple continued fever, 2 from diarrhœa, and 1 each from congenital syphilis, infantile convulsions, tetanus, teething, intussusception, nephritis, and burn.

Vaccination and Small-pox.—There was no case of small-pox in the Command during the year. There were 2 arm-to-arm revaccinations amongst children, both being successful.

Of 4 primary vaccinations with preserved lymph amongst the men and 169 amongst children, all the former and 55 of the latter were failures.

There were 84 revaccinations with preserved lymph amongst the men and 10 amongst children; 64 of the former and 3 of the latter were failures.

Sanitary Conditions.—The Principal Medical Officer, Surgeon-Major-General T. Maunsell, C.B., reports that the health of the troops during the year

Malta.

compared unfavourably with the previous year on account of the increase in the admissions for simple continued and enteric fevers, dysentery, malarial and venereal diseases. Overcrowding exists, and barrack accommodation has to be supplemented by tents, half the troops during the summer sleeping under canvas. The khaki drill clothing is considered unsuitable for the climate during the winter months, and warm underclothing or khaki serge is recommended. During the year the use of charcoal filters has been abolished throughout the Command, and Pasteur-Chamberland filters have been recommended in their place. The aqueduct water, used for cooking and drinking, is reported upon as good and pure, but taps, from which water for other purposes is drawn, are, in many instances, placed alongside the pure water taps, and this system is generally condemned. Arrangements were made for milk to be supplied to the troops and their families from animals milked in barracks under regimental supervision. No proper infectious diseases hospital exists. At Lower St. Elmo Barracks it is noted that the outfall of the town and barrack drain is close to the bathing place. The ablution rooms are dark and damp. Several cases of diarrhœa were traced to eating tinned fish from the canteen, and the supply was stopped. Electric light was being installed at the end of the year; a new men's latrine has been constructed, and the drainage improved. At Marsamuscetto Barracks the drainage has been improved and electric light was being installed. At San Francesco the drain has been relaid, and a covered bath provided for prisoners. These barracks and the Isola Gate Barracks are noted as faulty in construction, and some of the rooms are badly lighted and ventilated. The St. John's and St. Paul's Barracks are near the ventilating shaft of the main sewer, and sewer gas frequently pervades them. The stables in the Verdala Barracks have been condemned, and new stables and recreation room are being constructed at St. Clement's. The latrines and lavatories at the latter barracks are noted as damp and badly ventilated, and the water is supplied by hand labour. At Nôtre Dame the latrines are dark and badly ventilated, and there are no baths in the lavatory. A flushing tank for the main drain was provided. The Zabbar Gate Barracks, which were vacated in 1895 on account of defective drainage, were re-occupied in March 1896 after reconstruction of the drains. Some of the married quarters at St. Nicholas are noted as unsuitable. The construction and site of the Vittoriosa Barracks is noted as unfavourable for good ventilation, and the guard room and recreation room as dark. The married quarters in Fort Salvatore have no means of through ventilation and are very hot. At Fort Ricasoli the waterclosets of the officers and married quarters have been re-fitted. Some of the latter quarters are one-room quarters. The number of baths for the men is considered insufficient. At Upper St. Elmo the guard room is noted as dark and draughty. The drains of St. James' Cavalier were found defective in parts, and a portion of the drainage is being reconstructed. Electric light was being installed at the end of the year. In the Floriana district the ventilation of the huts of Nôtre Dame has been improved, and the Floriana Barracks were vacated from 16th September to 14th December, during the reconstruction of the drains, which had been found defective, subsequent to the occurrence of a case of enteric fever. The guard room is too small, and the lighting and ventilation of the barracks indifferent. At Fort Tigne the drainage of the hutments has been reconstructed, and some of the huts raised 3 feet above the concrete surface. The fort drainage is defective and, it is stated, will also be reconstructed. Three new blocks of married quarters, containing two to five rooms each, to accommodate 21 families, were completed and occupied. At Fort Manoel the system of supplying dry earth to latrines by automatic action was abolished as the apparatus was constantly getting out of order. The entire drainage was reconstructed, the battalion moving to Pembroke Camp until this was done. It returned in April, and shortly afterwards, during the month of May, nine cases of enteric fever occurred in some of the huts. These were again vacated, and the outbreak ceased. No insanitary conditions were detected to account for it, but the milk supply was suspected. Complaints were made that after heavy rains the aqueduct water deteriorates, and diarrhœa occurs. Two officers' and three soldiers' huts were raised to enable the surface underneath to be kept clean, and it is noted that all the huts should be similarly dealt with. The families are quartered some in hired houses and some in lodgings, which are not

Malta.

considered satisfactory. The main guard was enlarged. At Pembroke Camp two new blocks have been completed and occupied, and the drainage generally has been reconstructed. A new watercloset has been erected in the officers' quarters. The waterclosets in the new blocks are not considered satisfactory, and it is noted that the automatic apparatus in the dry earth closets get out of order, and that the latrines are badly situated. At Spinola Fort the reconstruction of the drainage was completed, and the officers' quarters remodelled. Overcrowding was of frequent occurrence, and the water supply at times scarce. At Pembroke Fort the surface drainage is noted as defective, and the dry earth latrines at Maddalena Fort as dark and badly ventilated. At Gebel Imtarfa seven new two-storied blocks were occupied at the beginning of the year. The general sanitary condition is considered very satisfactory, but the bath accommodation is noted as being quite inadequate. In the Station Hospital, Cottonera, a portion of the drainage was relaid. Some of the ablution rooms have no hot water laid on, and the ventilation and size of the kitchen are considered inadequate. The Station Hospital, Valetta, is old, and the surroundings insanitary. The accommodation is not sufficient and the number of beds in some of the wards has been increased. Re-appropriations were made to improve the bath-room, lavatory, and watercloset accommodation, quartermaster's store and reading room. The floor of the fever ward has been concreted, but not satisfactorily, and it is noted that the soft stone floors of the other wards also require to be replaced by concrete. The drains are defective, and are to be reconstructed. The Forrest Hospital is old, and the system of ventilation defective. The drainage is also defective and is to be reconstructed. The accommodation is insufficient, and is supplemented by tents. A new watercloset has been constructed and the soft stone floor replaced by concrete in five of the wards. The drainage at the Sanatorium, Citta Vecchia, is defective, and in course of reconstruction. The kitchen is dark, and the fuel allowance for March scarcely sufficient for warming the hospital during that month. Otherwise the Sanatorium is satisfactory, and has a beneficial effect on men sent to it. The general health of the troops in Gozo was very satisfactory and the sanitary condition good. The floors of all except one of the hospital wards have been concreted, and a linen store provided. The sanitary condition of Fort Lascaris, occupied by the Royal Malta Artillery, was generally satisfactory, but it was difficult to prevent overcrowding. The regimental hospital is within the grounds of the Valetta Station Hospital. The dining room accommodation has been improved, and the hospital sergeant's quarters provided with a new watercloset. The surgery is noted as small, and a separate barrack room is desired for the hospital orderlies.

ROYAL MALTA ARTILLERY.

The average strength of non-commissioned officers and men of this corps was 489, the principal statistics of sickness and mortality among them being given in the following table :—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
489	207	3	—	3	—	4	8·88	423·3	6·13	—	8·18	18·16

The admission rate is lower than that for the previous year by 58·1, and than the corresponding average ratio for the preceding ten years by 164·1 per 1,000; the death rate, 6·13 per 1,000, is lower than in 1895 by 1·85, but higher

Malta.

than the average by 3·68, while the constantly sick rate is higher by 1·25 and lower by 4·48 respectively in the two comparisons.

The average sick time to each soldier was 6·65 days, as compared with 6·17 in the year before, and 8·26 the average period for the preceding ten years; the average duration of each case of sickness, 15·70 days, is longer than in the previous year by 2·88, and than the decennial average period by 1·63 days.

The principal statistics of sickness and mortality arranged according to the several groups and orders of diseases will be found in Abstract IIIA.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—There was one admission for enteric fever, which ended fatally; no cause was assigned for the attack. Simple continued fever caused 23 admissions of which four were severe in type and of long duration, the ratio per 1,000 being 47·0 as compared with 55·8 in 1895, and 61·3, the decennial average rate.

For primary syphilis there were 7 admissions, for secondary syphilis 1, and for gonorrhœa 8, a total of 16 admissions for venereal affections, the ratio being 32·7 per 1,000, as against 34·6 in the preceding year, and 49·6, the average for the ten years 1886–95.

There was one admission under parasitic diseases, a case of tænia solium, while debility caused 6 admissions. Of 10 cases of rheumatism two were recorded under rheumatic fever, and there was a fatal case of tubercle of brain.

LOCAL DISEASES.—For diseases of the nervous system there were 3 admissions, one each for inflammation of spinal cord, neuralgia, and melancholia. Of 6 admissions for diseases of the eye, 4 were caused by conjunctivitis, and among 9 for diseases of other organs of special sense 5 were for inflammation of the external meatus, and 1 for nasal affection. There was one fatal case of valvular disease of the heart, and diseases of the respiratory system were represented by 16 cases of bronchitis, 2 of pleurisy, and 1 case of pneumonia, no death occurring. Diseases of the digestive system gave rise to 24 admissions, of which 11 were for sore throat, and 2 for hepatic affections. The other admissions for local diseases comprised 1 for retention of urine, 4 for orchitis, 1 each for inflammation of joint and ankylosis, 7 for abscess of the connective tissue, and 18 for skin diseases.

Of 52 cases of local injury 26 were due to wounds, 14 to blisters of feet, 5 each to contusions and sprains, 1 to fracture, and 1 to burn. The ratio of prevalence for injuries was 106·4 per 1,000, which is above that for 1895 by 24·0, but below the average rate for the preceding ten years by 17·4.

Invaliding.—There were 4 men discharged as medically unfit for further service, or a ratio of 8·18 per 1,000, which is higher than that for the previous year by ·20, but lower than the average for the ten years 1886–95 by 6·00. The causes of invaliding were keratitis, hernia, ankylosis, and ulcer of leg, one case each.

Officers.—There were 8 cases of sickness, including 3 of bronchitis and 2 of simple continued fever, the average strength being 20.

Women and Children.—In an average strength of 52 women, 13 cases occurred, 6 being cases of simple continued fever, and 3 remittent fever. There were 33 admissions and 3 deaths among the children, in an average strength of 152; the admissions including 6 for teething and 5 each for diarrhœa and simple continued fever. The three deaths were due to inflammation of the cerebral membranes, teething, and diarrhœa respectively.

Vaccination and Small-pox.—There was no case of small-pox during the year. There were 290 primary vaccinations with preserved lymph amongst the recruits and 21 amongst children; 71 of the former and 8 of the latter were failures. It is observed that the many failures were due to the first supply of calf lymph, as good results were not obtained in any one of the persons vaccinated with it.

IV.—ON THE HEALTH OF THE TROOPS SERVING IN THE DOMINION OF CANADA.

Sickness and Mortality.

Canada.

The average strength of the troops serving in the Command was 1,504, of whom 1,479 were stationed at Halifax, N.S., and 25 at Esquimalt, British Columbia. The force consisted of Nos. 1 and 20 Companies, Western Division, and the District Establishment, Royal Artillery, the 18th and 40th Companies, Royal Engineers, the 1st Battalion Royal Berkshire Regiment, and detachments of the Army Service, Medical Staff and Army Ordnance Corps, and Garrison Staff. No unit was relieved during the year.

The principal statistics of sickness and mortality are given in the following table:—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
1,504	856	4	1	5	24	14	42·66	569·1	3·32	15·96	9·31	28·36

Compared with a similar table for the previous year there is a decline of 16·6 in the admission rate and one of 2·62 in the death rate, but the ratio constantly sick shows an increase of 3·37. In comparison with average ratios for the preceding ten years the admission and constantly sick rates are higher by 69·6 and 2·70 per 1,000 respectively, while the ratio of mortality is lower by ·98.

The average sick time to each soldier was 10·38 days, which is longer than in 1895 by 1·26 and than the average period for the preceding ten years by 1·01; the average duration of each case of sickness was 18·24 days, or longer than in the preceding year by 2·67 days, although shorter than the decennial average period by ·51 of a day.

In Abstract XXV. are set forth the most important of the health statistics relating to the various corps which served in the Command during the year. Excluding detachments, the highest admission ratio, 670·6 per 1,000, occurred in the 1st Battalion Royal Berkshire Regiment, and the next highest, 624·1, in No. 1 Company, Western Division, Royal Artillery, the lowest ratio of admission being 269·8, in the 40th Company, Royal Engineers. All these units were stationed at Halifax. Amongst the detached troops the lowest ratio of admission was 227·3 per 1,000, namely, in the detachment of Royal Engineers at Esquimalt.

The four deaths in the Command occurred in the Royal Engineers and Infantry, one in the former and three in the latter, being in the ratio of 5·62 per 1,000 and 3·16 per 1,000 respectively. There was no mortality in the Royal Artillery.

The number constantly sick was highest in No. 1 Company, Western Division, Royal Artillery, being 34·26 per 1,000, the next highest constantly sick ratio was 33·24, in the Infantry battalion, and the lowest, 9·05 per 1,000, in the 40th Company, Royal Engineers.

Canada.

With regard to the influence of age on the sickness and mortality, it is found that the admission ratio among men under 20 years of age was 633·8 per 1,000, among men over 20 and under 25 years 716·5; in the next quinquennial age period 492·1, and among men over 30 years of age 215·7 per 1,000. In 1895 the highest admission ratio was amongst men under 20 years of age, and the lowest amongst men over 30, as in 1896. Three of the four deaths occurred in the age-group 20 to 25 years, and the remaining death in the age-group over 30, being in the ratio of 4·15 and 4·90 per 1,000 of the strength of these age-groups respectively.

As to service in the Command, the admission ratio among men in their first year was 666·7 per 1,000, and that among men in their second year 378 8; among men in their third year the ratio was 555·5, and among those who had three years' service or more 142·9. In the preceding year the highest admission ratio was amongst men in their first year and the lowest amongst men with over three years' service, thus corresponding with the results that have obtained in the year under review. Three of the men who died were in their first year and one in his second year of service in the Command, the mortality being in the ratio of 2·96 per 1,000 for the former, and 3·41 per 1,000 for the latter.

In Abstract IV. will be found the sickness, mortality, &c., arranged according to the different groups and orders of diseases.

GENERAL DISEASES.—*Diseases dependent upon Morbid Poisons.—Eruptive fevers* were represented by a single case of scarlet fever. There was one admission each for *dysentery* and *mumps*, and 36 cases of *influenza* were recorded. The total of the admissions under this sub-group was 39, equal to a ratio of 25·9 per 1,000, as compared with 10·4 in 1895, and 12·8 the average ratio for the preceding ten years, the increase in the admission ratio in the year under review being due entirely to the recorded cases of influenza. The disease is stated to have been prevalent during the months of March and April, and was not confined to any particular corps or barracks.

Under *malarial fevers* 2 admissions for ague are shown, both in the same man, who had contracted the disease in the West Indies.

Septic Diseases.—The single case recorded was one of erysipelas, of a mild nature.

Venereal Diseases.—Primary syphilis gave 52 admissions, or a ratio of 34·6 per 1,000, as compared with 27·5 in 1895 and 27·4 for the decennial period 1886–95. If to this be added the sickness from simple venereal ulcer, for which there were 23 admissions with 1·45 men constantly sick, the admission ratio for all primary venereal sores becomes 49·9 per 1,000, a ratio which exceeds the ratios of the previous year and the decennial average by 6·8 and 14·1 respectively. *Secondary syphilis* caused 20 admissions, or a ratio of 13·3 per 1,000, which is higher than that in 1895 by 5·2, but below the decennial average by 6·5. *Gonorrhœa* with 100 admissions gave a ratio of 66·5 per 1,000, or 22·6 per 1,000 below the previous year's rate, but above the average for the preceding ten years by 5·4. The total admission ratio for all classes of venereal disease equalled 129·7 per 1,000, a ratio lower than that of 1895 by 10·6, but higher than that of the decennial average by 13·0. The number of men constantly sick from all classes of venereal disease was 10·88, equal to a ratio of 7·23 per 1,000. This ratio is higher than the corresponding ratio in 1895 by ·90, and than that of the decennial average by ·24. A remarkable diminution in the number of days under treatment was effected in the cases of gonorrhœa by the medical officer in charge, Station Hospital, Halifax (Deputy-Surgeon-General W. S. Oliver, R.P.). Of 100 cases treated in that hospital, 83, treated by his method,* had an average duration of 11·88 days, and 17, treated in the usual way, an average duration of 21 days.

Parasitic Diseases.—One case of tænia solium is recorded. *Alcoholism* caused 3 admissions, but there was no case of delirium tremens. Under the heading of *debility* 6 cases were admitted.

---

* The treatment consists of free saline purgation on admission, milk diet, morning warm bath daily for half-an-hour, during which bath water is injected in a manner preventing the injection reaching the posterior portion of the urethra; and subsequent to the bath, four injections of 1 drachm each of a warm solution of 1 in 4,000 of perchloride of mercury. Rest in bed is enjoined. The injections are repeated in the evening.

Canada.

Rheumatism caused 71 admissions, or a ratio of 47·2 per 1,000, as compared with 34·1 in the previous year and 28·6 for the decennial period 1886–95. The large number of admissions for this disease is stated to have been influenced by extremes of temperature and moisture during the winter and spring months. There was only one admission for *tubercular disease* (tubercle of lung). This was also the cause of the single death amongst invalids. *Other diseases* of Group D. included 9 cases of non-malignant new growth and 2 of anæmia.

LOCAL DISEASES.—For *diseases of the nervous system*, including mental disorder, there were 4 admissions and one death, the admission ratio, 2·7 per 1,000, being below the previous year's rate and the decennial average by 11·4 and 8·2 respectively. The cases were 2 of inflammation of the brain, one of which was fatal, and 1 each of vertigo and mania.

Diseases of the Eye were the cause of 20 admissions, 16 of which were cases of conjunctivitis. The ratio of admission was 13·3 per 1,000, somewhat higher than the average. The cases of conjunctivitis were nearly all confined to the 1st Royal Berkshire Regiment, in Wellington Barracks. The disease prevailed amongst the civil population, and is said to have been conveyed to barracks from this source. *Diseases of the ear* gave 11 cases, or 7·3 per 1,000, as compared with 9·7 in 1895 and 6·3 during the previous decennial period. There was 1 death, from necrosis of the internal ear.

Diseases of the Circulatory System, with 8 cases and 1 death, gave an admission ratio of 5·3 per 1,000, a ratio lower than that of 1895 and the period 1886–95 by 3·6 and 4·1 respectively. The cases included 3 of valvular disease, 1 each of hypertrophy and dilatation of the heart, and 1 each of palpitation, dilatation of the aorta, and phlebitis. The death was due to aneurysm of the aorta. The case died out of hospital and consequently was not shown as an admission.

Diseases of the Respiratory System.—47 cases are returned with one death. The admission ratio, 31·2 per 1,000, is in excess of that for the previous year by 12·6, but is below the average for the preceding ten years by 5·1. There were 23 cases of bronchitis, 14 of pneumonia (including the fatal case), and 6 of pleurisy. The unusually large number of admissions for pneumonia is attributed to the prevalence of influenza. Ten of the cases occurred in April, May, and June, the spring weather being noted as late and inclement.

Diseases of the Digestive System gave 112 admissions, equal to 74·5 per 1,000, less than the previous year's rate by 28·7, but only slightly less than the average for the ten years. The cases included 81 of throat affections, 7 each of diarrhœa and piles, 4 of colic, and 4 of dyspepsia.

Diseases of the Lymphatic and Glandular System.—There were 44 admissions, the ratio, 29·2 per 1,000, being lower than that of 1895 by 2·8, but higher than the decennial average by 13·5. Inflammation and suppuration of the lymphatic glands were the chief causes of admission.

Diseases of the Urinary System caused 4 admissions, viz., 2 for acute nephritis and 1 each for Bright's disease and cystitis. *Diseases of the generative system* were represented by 55 admissions, of which 23 were for simple venereal ulcer, already referred to under the heading of venereal diseases, 12 for orchitis, 10 for balanitis, and 6 for stricture of the urethra. The ratio, 36·5 per 1,000, is higher than the ratios for the previous year, and for the decennial period by 8·3 and 11·0 respectively.

There were 25 admissions under the heading of *diseases of the organs of locomotion*, the equivalent ratio being 16·6 per 1,000, which is in excess of the rate for 1895 by 7·7, and of the average for the preceding ten years by 7·9 The cases included 14 of inflammation of joint, and 7 of flat feet. The seven admissions for flat feet are due to the fact that a man, suffering from this affection, had to be admitted seven times during the year. The case was eventually invalided.

Diseases of the Connective Tissue were the cause of 29 admissions, or a ratio of 19·3 per 1,000, the corresponding ratios in 1895 and during 1886–95 being 26·7 and 21·6 respectively.

Diseases of the Skin.—There were 77 admissions, the ratio, 51·2 per 1,000, being higher by 10·4 and 16·9 respectively in the two comparisons. Ulcers, whitlows and itch were the chief causes of admission.

Canada.

Injuries.—One admission for general injury is shown under the heading of electrical shock. For local injuries 109 cases are recorded, including 27 of contusion, 26 of sprain, 23 of wound, 12 of frost-bite, and 9 of fracture. The ratio of admissions for injuries was 73·2 per 1,000, or 8·4 below the previous year's ratio, and 3·5 below the average for the preceding ten years. The attacks of frost-bite are reported to have been mild, and to have effected chiefly the ears and hands; 10 occurred in January and 2 in February, and all are attributed to carelessness in not wearing the woollen comforters provided for each man.

Invaliding.—The number of men invalided to England during the year was 24, equal to a ratio of 15·96 per 1,000, which is higher than the ratios for 1895 and for the decennial period by 1·11 and 1·46 respectively. Including one man discharged in the Command, the ratio of invaliding in the Artillery was 27·36 per 1,000, that in the Engineers 11·24, in the Infantry 13·73, and in other corps 20·00. Of the men invalided, 2, or 28·17 per 1,000 of the strength of the age-group, were under 20 years of age; 13, or 17·98 per 1,000, were between 20 and 25 years; 9, or 17·78 per 1,000, were between 25 and 30; and 1, or 4·90 per 1,000, was over 30 years of age. As to service in the Command, 14 men, or 13·81 per 1,000, were in their first year; 9 men, or 30·72 per 1,000, were in their second year; 1 man, or 10·10 per 1,000, was in his third year; and 1, or 10·20 per 1,000, had been more than three years in the Command. The causes of invaliding were valvular disease of heart 3 cases, inflammation of joint 3 cases, debility, rheumatism, and secondary syphilis each 2 cases, and flat feet, tubercle of lung, mania, panophthalmitis, dilatation of heart, dilatation of aorta, bronchitis, pneumonic phthisis, Bright's disease, ankylosis, curvature of spine, gunshot wound, and fracture, one case each.

Including the man discharged locally, 14 men from the Command were discharged the Service as medically unfit during the year. This is equivalent to a ratio of 9·31 per 1,000, and is lower than the corresponding ratios in 1895 and in the previous decennial period by ·34 and 3·22 respectively. Of those discharged from the Command in the United Kingdom the disabilities were, valvular disease of heart 2, debility 2, and rheumatism, mania, panophthalmitis, dilatation of aorta, Bright's disease, ankylosis, curvature of spine, wound, and fracture, 1 each. The case discharged locally was one of valvular disease of heart.

Officers.—In an average strength of 64, there were 25 admissions, the ratio per 1,000 being 390·6, as compared with 406·2 in the previous year. Among the admissions were 5 for injuries, 2 each for hepatitis, stricture of urethra, and bronchitis, and single cases of various other disorders. No death occurred, nor was there any invaliding.

Women.—In an average strength of 136 there were 17 admissions, or 125·0 per 1,000, which is lower than the previous year's rate by 2·9. There was no death.

Children.—There were 25 admissions and 8 deaths in an average strength of 255. The ratio of admission was 98·0 per 1,000, and compares very favourably with the admission ratio in 1895, which was 446·3. The death rate, 31·37 per 1,000, is, however, higher by 10·71. The admissions included 7 of bronchitis, 4 of measles, and 2 each of tubercle of lung and diarrhœa. Two of the deaths were due to tubercle of lung, and one each to immaturity at birth, infantile convulsions, croup, bronchitis, diarrhœa, and asphyxia from submersion.

Vaccination and Small-pox.—There was no case of small-pox in the Command during the year. Of arm-to-arm vaccinations there were 27 primary and 4 re-vaccinations, 3 of the latter being failures. Of 18 primary vaccinations and 20 re-vaccinations from preserved lymph, 10 of the former and 12 of the latter were failures.

Sanitary Conditions.—In the report of the Principal Medical Officer Surgeon-Colonel W. McWatters, it is stated that the health of the troops has been good, considering the severe and changeable weather which prevailed throughout the year. The temperature reached 8° Fahr. below zero on the 29th January. The snowfall was moderate. Spring was severe and late, and the summer and autumn variable, with an unusual rainfall, 5½ inches being noted as having fallen on the 18th October.

Canada

The water supply of the Halifax garrison is good and abundant, and is furnished from lakes about 8 miles west of Halifax in a rocky wooded upland. The water supply to the forts has been improved.

A new well has been sunk at Fort McNab, and an underground storage tank constructed. A concrete storage tank has also been constructed at York Redoubt.

The wells have been protected from return drainage by concrete curbs and zinc covers. Conservancy arrangements are chiefly on the dry earth system, which is generally reported satisfactory. The rations are of good quality, but the Principal Medical Officer recommends a ration of mutton once a week, in place of beef, which is the only meat ration during the summer. Among the sanitary improvements effected in barracks during the year, iron ash bins have been provided in place of the old receptacles, the urinals at the citadel have been rebuilt, and the drainage improved. Wooden benches in ablution rooms have been replaced in some of the barracks by slate slabs. The drainage generally in the immediate vicinity of barracks and hospitals has been improved and new drainage works are being carried out in the city. The supply of hot water generally to ablution rooms has been extended. The station hospital, Halifax, is being thoroughly renovated, and wards and passages coated with "Duresco," which is reported to be a vast improvement on the old colour-washing.

Old pattern Jenning's waterclosets have been replaced by "Deluge" pedestal pans and flushing tanks. It is noted that there is a likelihood of the hospital soon being lighted with electricity. The need of an apparatus for disinfecting by moist heat is remarked upon, as no such apparatus exists in the locality. At present disinfection is carried out by steeping in corrosive sublimate solution, and boiling, a disused bath and boiler being used for the purpose. During the year the hospital was supplied with hot water tubes for heating purposes, in place of Galton's stoves, and a great improvement is noted in this respect. Arrangements have been made for the reception of women and children suffering from infectious diseases to the Civil Infectious Hospital, where they will be treated by officers of the Army Medical Staff.

Increased accommodation is in course of construction at the Military Prison, Melville Island. The warders' quarters in the prison are reported as requiring re-construction.

A branch of the Army Temperance Association was established in connexion with the Halifax Garrison during the year, and a considerable diminution in diseases caused by intemperance is noted.

At Victoria, B.C., the small detachment of troops are under the medical charge of an officer, Royal Navy, and the sick are treated in the Royal Naval Hospital, Esquimalt. Amongst sanitary improvements effected, a new bathroom has been constructed for the use of the married quarters, and a new drain from the barrack hospital, to the main drain of the barracks, has been completed.

V.—ON THE HEALTH OF THE TROOPS SERVING IN BERMUDA.

Sickness and Mortality.

Bermuda.

The average strength of warrant officers, non-commissioned officers and men serving in the Command during the year was 1,387, and the garrison throughout the year was composed of Nos. 3 and 19 Companies, Western Division, Royal Artillery, Nos. 27 and 36 Companies, Royal Engineers, the 2nd Battalion Leinster Regiment, detachments Army Service Corps, Medical Staff Corps, Army Ordnance Corps, and Garrison Staff.

The more important statistics of sickness and mortality among the troops are given in the following table:—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
1,387	653	8	—	8	19	1	37·26	470·8	5·77	13·70	·72	26·86

Compared with corresponding rates in the previous year a decline is observed in the ratios of sickness and mortality, the admission rate being lower by 209·2, the death rate by 11·51, and the constantly sick rate by 12·23 per 1,000.

Compared with the average rates for the preceding ten years the admission rate has decreased by 104·1, the mortality rate by 4·93, and the rate of constant inefficiency through sickness by 3·42 per 1,000. The average sick time to each soldier was 9·83 days, being shorter than the corresponding period in the previous year by 4·44, and than the average for the preceding ten years by 1·22 days. The average duration of each case of sickness was 20·88 days, which is shorter than in the previous year by ·10 of a day, but longer than the decennial average period by 1·65 days.

A table showing the statistics of sickness and mortality among the different corps which served in the Command during the year will be found in Abstract XXV. The highest admission rate, omitting detachments of small average strength, was 500·0 per 1,000 in No. 36 Company, Royal Engineers, and the lowest 366·7 per 1,000, in No. 27 Company, Royal Engineers. The constantly sick rate was highest, 40·93 per 1,000, in No. 19 Company, Western Division, Royal Artillery, and lowest, 20·00 per 1,000, in No. 27 Company, Royal Engineers. Of the total number of deaths 3, or 20·00 per 1,000, occurred in No. 19 Company, Royal Artillery, 2, or 18·87 per 1,000, in No. 36 Company, Royal Engineers, 1, or 6·71 per 1,000, in No. 3 Company, Western Division, Royal Artillery, 1, or 16·66 per 1,000, in No. 27 Company, Royal Engineers, and 1, or 1·18 per 1,000, in the 2nd Battalion Leinster Regiment. With regard to the influence of age on sickness and mortality, the admission rate among men under 20 years of age was 714·3 per 1,000, among men between 20 and 25 years of age 489·9, among men between 25 and 30 years of age 465·8, and among men over that age 346·6 per 1,000. Of the deaths 1, or 1·35 per 1,000, occurred among men between 20 and 25 years of age, 5, or 10·67 per 1,000, among men between 25 and 30 years of age, and 2, or 13·33 per 1,000, among men over 30 years of age. As in the preceding year, the highest admission rate was among men under 20 years of age, and the highest mortality rate among men over 30 years of age. Taking

Bermuda.

length of service in the Command, it is observed that the admission rate for men under one year's service in the Command was 525·9 per 1,000, among men in their second year of service 397·3, among men in their third year 401·6, and among men of over three years' service 312·5 per 1,000. Of the 8 deaths, 5, or 6·02 per 1,000, occurred among men in their first year of service, 2, or 5·40 per 1,000, among men in their second, and one among men with over three years' service in the Command. As in the previous year, the highest admission and mortality rates were among men in their first year of residence.

The admissions and deaths, &c., according to the different groups and orders of diseases, will be found in the table given in Abstract V.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—In the first sub-group of these diseases 52 admissions are recorded, of which 4 were cases of *dysentery*, all the remainder being due to continued fevers. *Enteric fever* caused 27 of these admissions, and there were 4 deaths, the ratio of admission being 19·5 and that of mortality 2·88 per 1,000, which are lower than the corresponding rates in the preceding year by 54·4 and 10·94, and than the average rates for the preceding ten years by 17·8 and 3·70 respectively. The per-centage of mortality to attacks was 14·8, as compared with 18·7 in 1895 and 17·6 during the previous ten years. Of the men attacked 16, or 21·6 per 1,000, were between 20 and 25 years of age; 9, or 19·2 per 1,000, were between 25 and 30 years of age; and 2, or 13·3 per 1,000, were men of over 30 years of age. Three of the deaths, or 4·05 per 1,000, were among men between 20 and 25 years of age; and 1, or 6·66 per 1,000, among men of over 30 years of age. As to service in the Command, 13, or 15·6 per 1,000, of the men attacked were in their first year; 11, or 29·7 per 1,000, in their second; 2, or 16·4 per 1,000, were in their third; and 1, or 32·3 per 1,000, was in his fourth year of service in the Command. Mortality was at the rate of 2·41 per 1,000 among men in their first year of service, dependent on 2 deaths; 1 death, or 2·70 per 1,000, occurred among men in their second year of service, and 1, or 32·36 per 1,000, occurred among men in their fourth year of residence. The great diminution in the number of cases of enteric fever which occurred in the year under report as compared with 1895 is attributed to the following causes:—

1. The abandonment of the old standing camp at Warwick with its polluted soil, and the selection of fresh sites for camping purposes.
2. Most careful attention to the general sanitation of barracks and camp.
3. Boiling and filtering of drinking water.
4. Cleansing and disinfection every week, under the supervision of a medical officer, of the water barrels.
5. Special attention to the ventilation of the tents at Warwick Camp during the night.
6. Improved drainage system (water carriage) throughout the Command.

No cause could be assigned for 18 of the 27 cases which occurred, but it is thought probable that they were due to air-borne infection. Of the 9 others, 4 were contracted in hospital whilst in attendance on other cases of enteric fever; 2, it was thought, were contracted at an eating house; 2 were suspiciously connected with the drainage which was undergoing re-construction; and one may have been caused by eating bread which came from a bakery where a case of enteric fever was under treatment. The Senior Medical Officer states, however, that "the disease is always present amongst the civil "population to a greater or less extent and will remain so until the cess-"pool disposal of sewage, which is universally adopted in the island, be done "away with and the water carriage system substituted."

The admissions for *simple continued fever* were 21 in number, equal to 15·1 per 1,000, which is considerably below the corresponding rate in the preceding year. 18 of the cases occurred at Prospect and 3 at St. George's.

Malarial fevers gave 7 admissions, or 5·0 per 1,000, which is below the rate in the previous year by 5·4, but above the decennial average rate by 3·5. All the cases were due to ague, and occurred among men who had served in India or Malta.

In the sub-group of *venereal diseases* it is observed that the number of admissions for *primary syphilis* was only 3, as compared with 18 in the previous

Bermuda.

year. If the sickness from simple venereal ulcer, for which there were 4 admissions and ·22 constantly sick, be added to the above, the admission ratio for primary venereal sores was equal to 5·0 per 1,000, which is lower than the corresponding rate in the previous year by 8·1, and than the average rate of the preceding ten years by 14·4 per 1,000. *Secondary syphilis* caused 17 admissions, being at the rate of 12·3 per 1,000, which is lower than that in the preceding year by 5·7, and than the decennial average rate by 5·2. The admissions for *gonorrhœa* were 27 in number, and the rate was 19·5 per 1,000, being a decrease of 10·2 as compared with the previous year's rate, and of 1·5 as compared with the decennial average rate. Including all forms of venereal disease, the total admission rate was 36·8 per 1,000, which is 24·0 below the rate in 1895, and 21·1 below the decennial average rate. The rate of constant inefficiency on account of these diseases was 3·12 per 1,000, or 2·53 below the previous year's rate, and 1·44 below the average rate.

Parasitic diseases were represented by a single case of tænia mediocanellata. Under the head of *alcoholism* 30 admissions are returned; the ratio, 21·6 per 1,000, is much in excess of that in the previous year. Three of the admissions were on account of delirium tremens.

The admissions for *debility* were only 8 in number, equal to a ratio of 5·8 per 1,000.

Rheumatism caused 20 admissions, or 14·4 per 1,000, which is 15·3 below the rate for 1895, and 5·0 below the average rate. There were two cases of rheumatic fever. Seven admissions are shown for *tubercular diseases* as compared with 2 in the previous year. The cases were all tubercle of lung and there were two deaths. The remaining 6 admissions in this group were cases of anæmia.

LOCAL DISEASES.—*Diseases of the Nervous System.*—8 admissions are returned, equal to a ratio of 5·8 per 1,000, which is below the previous year's rate by 7·3, and the decennial average rate by 2·9. Three of the admissions were cases of mental disease.

The number of admissions for *diseases of the eye* was 26, or 18·8 per 1,000, as compared with 7·6 in the previous year, and 11·9, the average rate of the preceding ten years. 23 of the cases were returned as conjunctivitis.

Diseases of other Organs of Special Sense with 17 admissious, or 12·3 per 1,000, show an increase of 4·0. 11 of the cases were cases of inflammation of the external meatus.

Diseases of the Circulatory System caused only 2 admissions, one for palpitation, and one for varicose veins. The admissions for *diseases of the respiratory system* were 25 in number, being in the ratio of 18·0 per 1,000, which is below the rate in 1895 by 6·9 and the decennial average rate by 7·8. Among the cases treated were 13 of bronchial affection, 4 of hæmorrhage of lung, and 2 each of asthma, pneumonia, and pleurisy. There was one death from empyema. *Diseases of the digestive system* caused 99 admissions, equal to a ratio of 71·4 per 1,000, which is below the previous year's rate by as much as 81·3, and the average rate by 36·5. Among the admissions were: 22 for affections of the mouth and throat, 17 for dyspepsia, 17 for jaundice, 14 for hepatitis, and 14 for diarrhœa.

Diseases of the Lymphatic and Glandular System caused only 3 admissions, or 2·2 per 1,000, which is much below the previous year's and average rates. There were 6 admissions for *urinary affections* as compared with 3 in the preceding year. *Diseases of the generative system* caused 12 admissions, 6 of which were for balanitis. The admission rate, 8·7 per 1,000, shows a decrease of 1·7 on the last year's rate. 15 admissions, or 10·8 per 1,000, are shown for *diseases of the organs of locomotion*, the ratio showing an increase over that of the preceding year. *Diseases of the connective tissue* caused 51 admissions, or 36·8 per 1,000, which is lower by 7·4 than the rate in the previous year. The admissions for *cutaneous diseases* were 53 in number; the ratio 38·2 per 1,000, is below the previous year's rate by 30·2, and below the average rate by 17·5. Most of the admissions were due to ulcers, boils, or eczema.

Injuries.—156 are returned, equal to a ratio of 112·5 per 1,000, as compared with 78·8 in the previous year. Nearly all the admissions were due to wounds, sprains, or contusions. There was one death from drowning.

Invaliding.—The number of men invalided home was 19, being in the ratio of 13·70 per 1,000, which is above the corresponding rate in the preceding year by 3·34, and above the average rate for the preceding ten years by ·83. The invaliding ratio in the Royal Artillery was 16·72 per 1,000, in the Royal Engineers 18·07, and in the Infantry 11·75 per 1,000. With regard to age, one man, or 35·71 per 1,000, was invalided under 20 years of age, 8 men, or 10·80 per 1,000, were between 20 and 25 years of age, 8 men, or 17·09 per 1,000, were between 25 and 30 years of age, and 2 men, or 13·33 per 1,000, were over that age. As to service in the Command, 15 men, or 40·54 per 1,000, were in their second year; 3 men, or 24·59 per 1,000, were in their third year; and 1 man, or 15·62 per 1,000, had been in residence over three years.

The causes of invaliding were: diseases of the nervous system 5 cases, diseases of the digestive system 3, tubercular diseases 3, and secondary syphilis, debility, diseases of the respiratory system, and urinary affections 2 cases each. Only one man, a case of tubercular disease of the lungs, was finally discharged the service by invaliding during the year.

Officers.—The average strength was 61, and there were 31 attacks of illness. The admission rate, 508·2 per 1,000, was higher than that in the previous year by 152·3. Among the cases treated were 4 of simple continued fever, 4 of rheumatism, one of remittent fever, and one of jaundice. Three officers were invalided, 2 on account of tubercular disease of the lungs, and one for melancholia.

Women.—The average strength was 110, and 95 attacks of illness are recorded. The admission rate was 863·6 per 1,000, as compared with 853·2 in the previous year. Two cases of enteric fever occurred, one of which proved fatal.

Children.—The average strength was 237, the attacks of illness were 168 in number, and there were 11 deaths. The admission ratio was, therefore, 708·9, and that of mortality 46·41 per 1,000, the former being lower by 244·4 and the latter higher by 23·05 than the corresponding rates in the previous year. Among the cases treated were 36 of diarrhœa, 20 of bronchitis, and 11 of debility. The deaths were due to diarrhœa (3), and dysentery, immaturity at birth, inflammation of the cerebral membranes, convulsions, bronchitis, pneumonia, teething and jaundice, one each.

Vaccination and Small-pox.—There were no cases of small-pox among the troops during the year. There were 12 arm-to-arm primary vaccinations and 1 re-vaccination amongst children. Three of the former were failures. Of 30 primary vaccinations and 1 re-vaccination with preserved lymph, amongst the children, the latter and 18 of the former were failures. Of 8 re-vaccinations amongst the men, 4 failed.

Sanitary Conditions.—The Senior Medical Officer (Brigade-Surgeon-Lieut.-Colonel G. D. N. Leake) reports that the health of the troops has improved, owing to the decrease in enteric fever. Intemperance, and sickness resulting from it, was, however, very prevalent, and has been attributed, in some cases, to the cheap and bad quality of whisky and rum obtainable at the grog shops in Hamilton, and, in others, to the fact that the beer sold in the canteens is strong, as "the milder ales will not keep" in the climate. Khaki drill clothing is generally condemned as insufficient protection against chill in the winter months, and warm underclothing or serge is recommended. A water carriage system for the removal of foul water has been gradually introduced throughout the command, in place of the old cesspools, and is practically completed except at St. George's. The dry-earth system of latrines is in use, but the Senior Medical Officer considers it unsuitable in the Bermuda climate, and recommends that the water-carriage system should be extended, and sea-water laid on for flushing. Sea water is also recommended as a substitute for the well water, used for other than drinking and cooking purposes. It is noted that the well water is always polluted, and is not sufficiently brackish to prevent its being mistaken for drinking water. The latter is rain water collected on roofs and catchment areas, and stored in tanks, some of which are underground, the water being conducted to them in underground earthenware pipes. The system requires constant care and supervision in order to prevent pollution, and the porous nature of the rock which forms the geological structure of the islands, is such that contamination from surface washings, *Bermuda.*

&c., is very liable to take place in all underground channels. The earthenware pipes are consequently considered unsuitable. Amongst the requirements of the command are Pasteur-Chamberland filters in place of the old charcoal filters, a steam disinfecting apparatus, and an infectious diseases ward for women and children. A suggestion to accommodate this class of cases in the Civil Cottage Hospital is under consideration. At Prospect a large tank has been provided for supplying water to the hospital, the lunatic ward has been remodelled and the ventilation improved, and a water-carriage system of sewage disposal has been experimentally tried in one or two blocks. It is noted that the ashbins are generally insanitary in construction, the kitchens small and in bad repair, the huts old and dilapidated, and the arrangements for the removal of nightsoil from the married quarters unsatisfactory. The Warwick camp of musketry was opened on 13th April, and closed on 15th December. The ground occupied was that used at the end of 1895, the camp having then being shifted from the old site. This alteration of site is regarded as the cause of no enteric fever cases having occurred during the year, as compared with 31 in 1895, when the old site was occupied. The water supply of the camp was brought in barrels, which were cleansed and disinfected with corrosive sublimate weekly. The water was boiled daily. At St. George's there were 15 cases of enteric fever as compared with 46 in 1895. This decrease is attributed to the better sanitary condition of the town, and the closing of insanitary eating houses. Several tanks were repaired or reconstructed, the new hospital drainage completed and progress made in the reconstruction of the barrack drainage. Some minor improvements were also effected. It is noted that several of the married quarters are 1-room quarters. At Watford there were 2 cases of enteric, contracted, it was supposed, at Somerset. The drainage was being reconstructed. The roof of the hospital was in bad repair. At Boaz and Ireland islands the drainage was reconstructed, and automatic apparatus provided for the dry earth closets. The small amount of venereal diseases in this command has been commented upon. The Senior Medical Officer has reported that this is due to a combination of causes, notably the fewer facilities for contracting these diseases, and the fact that temporary matrimonial alliances are frequently made.

VI.—ON THE HEALTH OF THE TROOPS SERVING IN THE WEST INDIES.

Sickness and Mortality.

I.—EUROPEAN TROOPS.

The average strength of the troops serving in the West Indies during the year was 1,293. Of these, 766 were stationed in the Barbados Command and 527 in Jamaica. The force in the Barbados Command consisted of the 23rd Company, Western Division, and the District Establishment, Royal Artillery, a small detachment of the Royal Engineers, the headquarters and five companies of the 1st Battalion Liverpool Regiment, and detachments of the Army Service, Medical Staff, and Army Ordnance Corps, &c. In Jamaica the troops comprised the 14th Company, Western Division, Royal Artillery, and detachments of the Royal Engineers, 1st Battalion Liverpool Regiment, Army Service, Medical Staff, and Army Ordnance Corps and Garrison Staff. No change occurred in the composition of either garrison during the year. The stations occupied were Barbados and St. Lucia, with an average strength of 854 and 218 respectively in the Barbados Command, and Newcastle, with an average strength of 317, Port Royal with 137, and Up Park Camp with 73, in Jamaica. *West Indies.*

The more important statistics of sickness and mortality among the troops in each division of the Command, as well as of those in the West Indies taken as a whole, are shown in the subjoined table.

1896.	Average Strength.	Admissions.	Deaths.			Invalids.	
			In the Command.	Of Invalids.	Total.	Sent Home.	Finally discharged.
Barbados Command.	766	1,108	3	—	3	20	11
Jamaica - -	527	431	5	—	5	6	3
West Indies -	1,293	1,539	8	—	8	26	14

(*continued.*)

1896.	Average constantly Sick.	Ratio per 1,000 of Strength.				
		Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.
Barbados Command -	70·56	1446·5	3·92	26·11	14·36	92·11
Jamaica - -	30·81	817·8	9·49	11·38	5·69	58·46
West Indies - -	101·37	1190·2	6·19	20·11	10·83	78·40

West Indies. In comparing the statistics of sickness and mortality in the Barbados Command with those given in a similar table in the report for 1895, an increase of 104·2 is observed in the admission rate, and of 17·93 in the ratio constantly sick, but there is a decrease of 10·96 in the death rate. The average sick time to each soldier was 33·71, and the average duration of each case of sickness 23·31 days, which are longer than corresponding periods in the previous year by 6·64 and 3 14 days respectively.

In Jamaica the admission, death, and constantly sick rates are higher by 120·7, 4·02, and 11·78 per 1,000 respectively. The average sick time to each soldier and the average duration of each case of sickness, 21·40 and 26·16 days respectively, were both higher than in the year before, the former by 4·36 and the latter by 1·72 days.

Taking all the European troops in the West Indies together, the admission rate has increased by 122·6, and the constantly sick rate by 15·93, while the death rate has declined by 4·69 per 1,000, as compared with corresponding ratios in the previous year. In comparison with similar average ratios for the ten years 1886-95, the admission and constantly sick rates are higher by 74·5 and 16·29 respectively, while the death rate is lower by 3·04. The average sick time to each soldier was 28·69 days, which is longer than the corresponding period in 1895 by 5·89 and than the decennial average period by 6·02; while the average duration of each case of sickness was 24·11 days, being longer in the two comparisons by 2·75 and 3·79 days respectively.

The principal statistics of sickness and mortality in the various corps which served in the West Indies during the year are given in Abstract XXV. The admission and constantly sick ratios in No. 23 Company, Western Division, Royal Artillery, in Barbados and St. Lucia, were 1694·0 and 82·39, and those in No. 14 Company in Jamaica, 1169·2 and 66·15 per 1,000 respectively; no death occurred in the former, but there were 2 deaths in the latter company, the equivalent ratio being 15·38 per 1,000. In the headquarters of the 1st Battalion Liverpool Regiment in Barbados and St. Lucia, the admission, death, and constantly sick rates were 1486·9, 3·50, and 101·68 per 1,000, those in the wing in Jamaica being 808·7, 3·36, and 65·03 respectively. With reference to the influence of age on the sickness and mortality, it is found that the admission rate among men under 20 years of age was 1208·3 per 1,000, dependent, however, upon a small strength; taking the age-group 20 to 25 years of age, which gave the largest strength, the ratio was 1633·0 per 1,000, as compared with 1274·2 in 1895; among men between 25 and 30 years an admission rate of 981·3 per 1,000 is observed as compared with 910·8, and among those of 30 years of age and upwards a rate of 372·8 compared with 370·6 in the preceding year. Mortality was *nil* among men under 20 years of age, at the rate of 7·09 among those between 20 and 25, 5·60 among men between 25 and 30, and 5·92 among men of 30 years of age and upwards. With regard to length of service in the West Indies the ratio of admission was 1331·5 among men in their first year, falling to 851·1 among those in their second year; among men in their third year it was 942·5 per 1,000, falling again to 566·7 among men who had been three years or longer in residence. In the preceding year the admission ratios fluctuated in a similar manner. The mortality rate among men in their first year of service was 4·38 per 1,000, that among men in their second year being 3·82; a rate of 11·49 per 1,000 occurred among those in their third year, and one of 66·67 among men of more than three years' service.

In Abstract VI. will be found the more important of the statistics of sickness and mortality arranged according to the different groups and orders of diseases.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.—Eruptive fevers* were represented by 9 admissions for dengue at Barbados. No case occurred in 1895.

Enteric Fever caused 4 admissions, or a ratio of 3·1 per 1,000, as compared with 4·7 in 1895 and 8·9 the average rate for the preceding ten years. There was no death. Two of the cases were admitted in Barbados, and, although careful investigation was made, no cause for their occurrence could be discovered. The other two cases were admitted at Newcastle, Jamaica, but in neither of them was the disease contracted at that station, the origin being traced to

West Indies.

Kingston and to the drinking freely of water obtained from roadside streams which were well known to be much polluted by sewage and other impurities.

The admission rate for enteric fever in the Barbados Command was 2·6 per 1,000, and for Jamaica 3·30, as compared with 4·1 and 5·5 respectively in 1895.

For *simple continued fever* there were 90 admissions, of which 29 occurred in the Barbados Command and 61 in Jamaica, the ratio, 69·6 per 1,000, being above that for the previous year by 31·5, but below the decennial average rate by 32·0.

There was no admission for *yellow fever* during the year.

Dysentery caused only 3 admissions, all in Jamaica, as compared with 11 in 1895. There was a fatal case of *diphtheria* in St. Lucia, the disease being probably contracted in the town of Castries.

Malarial Fevers caused 116 admissions, including 82 for ague, 32 for remittent fever, and 2 for malarial cachexia, the equivalent ratio being 89·7, which is above the ratios for the previous year and the decennial period by 6·6 and 42·5 respectively. In St. Lucia there were 77 cases of ague and 13 of remittent fever; in Barbados 2 of ague, 4 of remittent fever, and 1 of malarial cachexia; and the remainder occurred in Jamaica, mostly at Up Park Camp.

Venereal Diseases.—There were 102 admissions for *primary syphilis*, or a ratio of 78·9 per 1,000, which is higher than that for the preceding year by 24·5. Including simple venereal ulcer, for which there were 129 admissions and 10·28 men constantly sick, the admission ratio for primary venereal sores was 178·6 per 1,000, which is above the previous year's rate and the average for ten years by 37·2 and 45·2 respectively, the ratio of constant inefficiency, 15·98 per 1,000, being higher in the two comparisons by 4·04 and 5·40. The admission ratio for primary venereal sores in the Barbados Command was 232·4, and the ratio constantly sick 20·47, both higher than in 1895 by 87·6 and 7·83 per 1,000 respectively; in Jamaica the admission rate, 100·6, and the constantly sick rate, 9·47 per 1,000, are lower than in the previous year by 36·2 and 1·53. The admissions for *secondary syphilis* were 99 in number, and 9·86 men were constantly sick, the equivalent ratios being 76·6 and 7·63 per 1,000 respectively, which are higher than the previous year's ratios by 30·8 and 2·49, and than the average rates by 37·5 and 3·61 respectively. In the Barbados Command the ratios of admission and constantly sick were 84·8 and 9·62, as compared with 47·4 and 5·53 in the year before, and in Jamaica they were 64·5 and 4·72 as against 43·8 and 4·60. *Gonorrhœa* caused 206 admissions and the constant sickness of 15·89 men, equal to ratios of 159·3 and 12·29 per 1,000 respectively, higher than in 1895 by 14·0 and 3·98, and than the average rates by 8·3 and 1·53. In the Barbados Command the ratio of admission was 206·3 and that of constantly sick 15·48, the former being higher by 10·1 and the latter by 4·03 than in the previous year. In Jamaica these rates equalled 91·1 and 7·65, as compared with 76·6 and 4·09 in 1895.

Taking all these various forms of venereal disease together, the total admission rate was 414·5 per 1,000, which is above the previous year's rate and the average for the preceding ten years by 82·0 and 91·0 respectively. The total ratio of constant inefficiency on account of these diseases was 35·90 per 1,000, also higher in the two comparisons by 10·51 and 10·54. In the Barbados Command the total admission ratio was 523·5, and the total constantly sick rate 45·57 per 1,000, as compared with 388·4 and 29·62 in the preceding year, and in Jamaica the rates were 256·2 and 21·84, as against 257·2 and 19·69 in 1895.

Parasitic Diseases were represented by a single case of tænia solium, and of 16 cases of *alcoholism* one was returned as delirium tremens. There were 21 cases of *debility*, of which 18 occurred in the Barbados Command, the ratio, 16·2 per 1,000, being below the previous year's rate by 3·2, but slightly in excess of the average.

For *rheumatism* there were 63 admissions, including 2 for rheumatic fever, equal to a ratio of 48·8 per 1,000, which is below that for 1895 by 5·6, but above the average for the preceding ten years by 11·5; 55 of the cases occurred in the Barbados Command.

West Indies. There were 7 admissions for *tubercular disease* of the lung, with 2 deaths, the admission ratio, 5·4 per 1,000, being greatly in excess of the previous year's and average rates.

The admissions for *other diseases* of Group D. included 11 for non-malignant and 1 for malignant new growths, and 2 for anæmia.

LOCAL DISEASES.—*Diseases of the Nervous System* caused 11 admissions, or a ratio of 8·5 per 1,000, which is less than the previous year's rate and the average for the preceding ten years by 3·9 and 5·7. In the Barbados Command the cases were 4 of neuralgia, 3 of neuritis and 1 of epilepsy, and in Jamaica 2 of neuralgia and 1 of epilepsy.

Diseases of the Eye, with 14 admissions, gave a ratio of 10·3 per 1,000, which is higher than that recorded for 1895 by 3·0, but below the ten years' average rate by 1·6. Of the cases, 10 occurred in the Barbados Command. *Diseases of other organs of special sense* gave an admission ratio of 24·0 per 1,000, which is lower than the previous year's rate by 3·2, but higher than the average by 1·5. Of 31 cases 19 were returned as inflammation of the external meatus, and 9 as perforation of membranum tympanum. Only 7 of the admissions occurred in Jamaica.

Diseases of the Circulatory System.—There were 15 admissions, the ratio, 11·6 per 1,000, being higher than that for the previous year and than the decennial average rate by 8·5 and 1·9 respectively. In the Barbados Command there were 4 cases each of palpitation and varicose veins and 3 of valvular disease of the heart, and in Jamaica 2 cases each of palpitation and valvular disease.

Diseases of the Respiratory System were the cause of 26 admissions, equal to a ratio of 20·1 per 1,000, as compared with 21·8 in 1895 and 28·7, the average rate for the preceding ten years. Of 18 cases of bronchitis 10 occurred in Jamaica, where there was also 1 case of asthma. Two cases each of pleurisy, pneumonia, and pneumonic phthisis were recorded in the Barbados Command.

Diseases of the Digestive System caused 131 admissions and 2 deaths. The admission rate was 101·3 per 1,000, which is in excess of that for 1895 and of the average rate for the ten years 1886–95 by 32·9 and 1·7 respectively. There were 92 cases in the Barbados Command and 39 in Jamaica, the total including 36 of diseases of the mouth and throat, 37 of dyspepsia, 19 of hepatic disorder, and 15 of colic. The two deaths occurred in Jamaica, and were due to abscess of liver.

Diseases of the Lymphatic and Glandular System gave a ratio of 62·6 per 1,000, which is greater than the previous year's and average rates by 14·4 and 18·9 respectively. *Diseases of the urinary system*, with 4 admissions, were rather more frequent than usual, while *diseases of the generative system*, with 153 admissions, mostly due to simple venereal ulcer and balanitis, gave a ratio of 118·3 per 1,000, which differs but little from the previous year's and average rates. For *diseases of the organs of locomotion* there were 21 admissions, or a ratio of 16·2 per 1,000, which is higher than that for the previous year and the average rate by 6·9 and 7·8 respectively. All but 5 of the cases were due to synovitis. *Diseases of the connective tissue*, with 37 admissions, gave a ratio of 28·6 per 1,000, as compared with 41·2 in 1895, and 39·9 the average rate. *Diseases of the skin* were the cause of 88 admissions, the equivalent ratio being 68·1 per 1,000, which compares favourably with 94·0 in the previous year and with 79·6, the average rate for the preceding ten years. Of the 88 admissions, 72 occurred in the Barbados Command; eczema, boils, and ringworm being the most frequent causes.

Injuries.—172 admissions and 3 deaths are returned. The admission ratio, 133·0 per 1,000, is higher than in 1895 by 7·9, but lower than the decennial average rate by 5·7. One admission is recorded in Barbados for general injury, namely, a case of shock, and at Port Royal, Jamaica, there was a death from drowning. Of 171 admissions for local injury the majority were caused by abrasions, contusions, wounds, and sprains, and the deaths were one from fracture of the base of skull in St. Lucia, the result of a fall, and one at Newcastle, Jamaica, from contusion of abdomen with rupture of viscera, caused by the fall of a rock.

Invaliding.—The number of men invalided home from the West Indies was 26, equal to a ratio of 20·11 per 1,000, which is above the corresponding rate in the previous year and the decennial average rate by 3·02 and ·44

West Indies.

respectively. The invaliding rate for the Barbados Command was 26·11 per 1,000, and that for Jamaica 11·38, as compared with 24·36 and 7·30 in 1895. Of the men invalided the 1st Battalion Liverpool Regiment furnished 16, the Artillery 5, and other corps 5. With regard to age 11 men, or 19·50 per 1,000, were between 20 and 25 years of age, 10 men, or 18·66 per 1,000, were between 25 and 30, and 5 men, or 29·59 per 1,000, were over 30 years of age. With regard to service in the West Indies, 18 men, or 19·69 per 1,000, were in their first year of service, 3 men, or 11·45 per 1,000, were in their second year, and 5 men, or 57·47 per 1,000, were in their third year of residence.

The causes of invaliding were malarial fever, rheumatism, and aural affections 3 cases each, diseases of the eye 2, valvular disease of the heart 2, inflammation of lymphatic glands 2, and enteric fever, dysentery, secondary syphilis, debility, tubercle of lung, malignant new growth, neuritis, epilepsy, varicose veins, pneumonic phthisis, and synovitis, one case each.

The number of men discharged the service during the year as medically unfit for further service was 14, equal to a ratio of 10·83 per 1,000, which is less than the corresponding rate in the previous year and the average rate of the preceding ten years by ·05 and 2·71 respectively. The number of men from the Barbados Command who were discharged as invalids was 11, or 14·36 per 1,000, and from Jamaica 3, or 5·69 per 1,000. The disabilities necessitating discharge were 2 cases each of diseases of the eye, aural diseases, and valvular disease of the heart, and 1 case each of secondary syphilis, rheumatic fever, tubercle of lung, epilepsy, varicose veins, pneumonic phthisis, Bright's disease, and synovitis.

Officers.—The average strength was 120, 54 being stationed in the Barbados Command and 66 in Jamaica. The attacks were 59 in the former and 37 in the latter, a total of 96, giving a ratio of sickness of 800·0, which is higher than the corresponding rate in the preceding year by 136·4. Among the cases treated were 22 of malarial fever, 9 of simple continued fever, 8 of diarrhœa, and 3 of enteric fever. The cases of enteric fever occurred at Barbados, but no cause could be discovered. There was no death. 7 officers were invalided, 3 on account of enteric fever, 2 for dysentery, and one each for debility and obstruction of intestines.

Women.—The average strength was 118, and the attacks of illness 114, equal to a ratio of 966·0 per 1,000, an increase of 319·5 on the previous year's rate. There were two deaths, or 16·93 per 1,000, as compared with 8·62 in 1895. In the Barbados Command the strength was 67, and the cases of sickness 49,and in Jamaica the strength was 51 and the cases of sickness 65. The principal causes of sickness were debility 31 cases, diseases of the generative system 16, malarial fevers 7, dyspepsia 7, and rheumatism 4. There was one case of diphtheria at Barbados. One death was due to remittent fever and one to dilatation of heart.

Children.—The average strength was 189, 103 being at Barbados and 86 at Jamaica. There were 47 cases of sickness in the former Command and 71 in the latter, the total, 118, giving a ratio of sickness equal to 624·3 per 1,000, which is higher by 90·7 than the rate in the preceding year. There were 3 deaths, or 15·87 per 1,000, a decrease of 22·59. Of these 1 occurred in the Barbados command and 2 at Jamaica. The cases included 19 of measles, 14 of diarrhœa, 14 of bronchitis, 9 of debility, 7 of malarial fever, and 5 of simple continued fever, and there was one death each from immaturity at birth, convulsions, and croup.

Vaccination and Small-pox.—There were no cases of small-pox in either the Barbados or Jamaica Command during the year. In Barbados of 24 primary vaccinations with preserved lymph amongst children, 14 were failures. There were 68 re-vaccinations with preserved lymph amongst the men, with 39 failures, 4 amongst the women, all failures, and 19 amongst the children, with 11 failures. In Jamaica, of 26 primary vaccinations with preserved lymph amongst the children, 16 were failures, and in two cases of re-vaccination (1 man and 1 child) both failed.

Sanitary Conditions.—In Jamaica the health of the troops was considered generally good. At Up Park Camp great improvement was effected in concreting the soil under the barrack rooms and hospital. A similar improvement is desirable in the officers' quarters. The dry-earth system is

West Indies. reported to work well, but the outfall of the foul water drains into a ravine near the officers' mess is reported insanitary, and the connection of these drains with the town drainage, which has an outfall into the sea, is recommended. During August the supply of the Wag river water, which was used for drinking and cooking, was cut off owing to a tunnel falling in. The Hope river water has since been used for all purposes. It is very turbid during heavy rains, and filtering beds are recommended. An outbreak of dysentery was attributed to its use, which is said to have ceased after a large twin Pasteur-Chamberland filter was obtained and taken into use. Single-candle filters have also been obtained for the hospital and other establishments, but when the water is turbid these filters are said to get clogged. More filters are required, the existing one supplying only 250 gallons in 24 hours. The married quarters were provided with new cooking ranges, and the hospital with a Reck's steam disinfecting apparatus and new ablution room. It is noted that the steward's store and drug store at the hospital are badly lighted and ventilated and damp, and that the men of the Medical Staff Corps are quartered too far from the hospital. At Newcastle the sanitary conditions are reported to be very favourable to health. The water supply is from mountain springs not liable to pollution. There is a dry-earth system of conservancy. There is considerable variation of temperature between night and day, and protection against abdominal chill is considered necessary. The hospital was re-roofed, and a new infantry guard-room was in course of construction during the year. At Port Royal the surface drainage of the native town was improved. A new barrack for non-European troops was built. The barracks are not considered sufficient to accommodate the troops when at full strength. The water supply is from the Rock spring, and is of good quality, but it is brought in tank-boats, stored in tanks, and distributed by carts and barrels. It is supplemented by rain-water. There was an epidemic of measles during the year, and the schools were closed. The sanitary condition of the Harbour Forts is considered satisfactory.

In Barbados venereal disease has largely increased, but the general health was otherwise good. Enteric fever is noted to have been prevalent amongst the civil population, and 2 men and 3 officers were attacked amongst the troops. The water supply is from the Barbados and Bridgetown Water Company, and is said to be good and abundant. Other sanitary conditions are also reported to be good. Several minor improvements were effected.

In St. Lucia a considerable amount of disease was due to intemperance, liquor being easily procurable at numerous grog-shops. The water supply is rain collected on roofs and stored in iron tanks. It is reported good and sufficient. During the year baths were provided for the married quarters at Morne, the Royal Artillery and the Royal Engineers officers' quarters at La Toc were completed and occupied, and the drainage system improved and carried out to the sea. The ablution accommodation was increased at Vielle Ville Barracks and at the Vigne hutments, and the drainage system of the latter extended.

II.—NON-EUROPEAN TROOPS.

The average strength of non-commissioned officers and men, exclusive of European sergeants, was 1,525, of whom 536 were stationed in the Barbados Command and 989 in Jamaica. The force in the Barbados Command consisted of the St. Lucia Company, Royal Artillery, and detachments of the West India Fortress Company, Royal Engineers, and 1st Battalion West India Regiment. The stations occupied were Barbados and St. Lucia, average strength 257 and 279 respectively. In Jamaica were the Jamaica Company, Royal Artillery, the West India Submarine Mining and Fortress Companies, Royal Engineers, and the headquarters of the 1st Battalion and the Depôt of the West India Regiment. The stations occupied were Port Royal, average strength 187, and Up Park Camp, 802. No change occurred in the composition of either garrison during the year.

West Indies.

The more important statistics of the sickness and mortality among non-European troops in each of the divisions, as well as among those serving in the West Indies as a whole, will be found in the subjoined table:—

1896.	Average Strength.	Admissions.	Deaths.			Invalids.	
			In the Command.	Of Invalids.	Total.	Sent Home.	Finally discharged.
Barbados Command.	536	540	10	—	10	—	9
Jamaica - -	989	980	8	—	8	—	55
West Indies -	1,525	1,520	18	—	18	—	64

(continued.)

1896.	Average constantly Sick.	Ratio per 1,000 of Strength.				
		Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Average constantly Sick.
Barbados Command -	32·39	1007·5	18·66	—	16·79	60·43
Jamaica - -	80·27	990·9	8·08	—	55·61	81·16
West Indies - -	112·66	996·7	11·80	—	41·97	73·87

Taking the statistics for the Barbados Command and comparing them with those recorded in the previous year, a decrease of 92·5 is observed in the admission rate, but the death and constantly sick rates have increased by 8·24 and 1·20 per 1,000 respectively. The average sick time to each soldier was 22·12 days, which is longer by half a day than the corresponding period in the previous year. The average duration of each case of sickness was 21·95 days, which is greater by 2·30 days.

In Jamaica there was a decrease of 9·1 per 1,000 in the ratio of admission, and one of 2·48 in that of mortality, but a rise of 11·60 occurred in the constantly sick rate. The average sick time to each soldier was 29·70 days, which is longer than in 1895 by 4·31, and the average duration of each case of sickness, 29·98 days, is also longer by 4·59.

Taking all the non-European troops in the West Indies together, it is observed that the admission rate is lower by 36 9, while the death and constantly sick rates are higher than in 1895 by 1·29 and 7·79 respectively. In comparison with average ratios for the preceding ten years, the admission and mortality rates show a decrease of 195·3 and ·81, but the constantly sick rate is higher by 1·15 per 1,000, The average sick time to each soldier, 27·04 days, was longer than in 1895 by 2·92, and than the corresponding average period for the preceding ten years by ·50; the average duration of each case of sickness, 27·13 days, is longer in the former comparison by 3·80, and in the latter by 4·87 days.

With regard to the sickness and mortality of individual corps in the Barbados Command, the admission rate for the St. Lucia Company, Royal Artillery, was 880·0, that for the West India Fortress Company, Royal Engineers, 833·3, for the detachment of the West India Regiment at Barbados 1027·3, and

West Indies. for that at St. Lucia 1074·1. There were 5 deaths in the Artillery, 4 in the Infantry, and 1 in the Engineers, the corresponding ratios being 50·00, 9·57, and 55·55 per 1,000.

In Jamaica the Jamaica Company, Royal Artillery, had an admission ratio of 1340·9, and a mortality rate of 11·36, one death being recorded; the West India Submarine and Fortress Companies, Royal Engineers, gave an admission rate of 510·0, and the 1st Battalion of the West India Regiment, an admission rate of 1046·5, and a death rate of 5·17 per 1,000, three deaths occurring. In the Depôt, West India Regiment, the admission rate was 948·8, and that of mortality 4·65, dependent upon one death.

Taking the troops in the West Indies together, the sickness according to age shows that among men under 20 years of age the admission ratio was 767·2 per 1,000, among men between 20 and 25 years of age it was 1766·8, among men between 25 and 30, 766·7, and among men over 30 years of age 278·9 per 1,000, the rise and fall of the several ratios following a course similar to that observed in the previous year. There was no mortality among men under 20 years of age; among men between 20 and 25 years of age the ratio was 13·06 per 1,000, dependent on 7 deaths; among men between 25 and 30 years of age 16·22, dependent on 8 deaths, and among men over that age 7·89, dependent on 3 deaths. In the previous year the highest mortality rate was among men between 20 and 25 years of age. With regard to length of service the admission ratio among men in their first year was 629·1 per 1,000, among men in their second year 1598·0, among men in their third year 1224·4, and among men over three years' service 795·1. In 1895 the highest ratio was also among men in their second year, but the lowest occurred among men of over three years' service. The mortality rate among men in their first year of service was 12·65, dependent upon 1 death; among men in their second year 13·46 per 1,000 (7 deaths); among men in their third year 20·40 per 1,000 (one death), and among men over three years' service 54·21 per 1,000 (9 deaths). In the previous year the highest death-rate was among men in their first year, and the lowest among men with more than three years' service.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—The admissions recorded under the head of *eruptive fevers* were 20 in number, or 13·1 per 1,000, an increase of 6·8 on the corresponding rate in the previous year. The cases comprised 1 of cow-pox, 2 of chicken-pox, and 17 of measles, 5 of the last-named occurring at Barbados and 12 at Jamaica. There was no admission for *enteric fever*. *Simple continued fever* was the cause of 21 admissions at Jamaica and 16 in the Barbados Command, a total of 37, or a ratio of 24·3, which compares favourably with 47·0 in the previous year, and 100·6, the average rate. There was no case of *yellow fever*. The admissions for *dysentery* numbered 45, the ratio, 29·5 per 1,000, being above the rate for 1895 and the average rate by 24·6 and 16·9 respectively. All the cases occurred in Jamaica. *Other diseases* of the 1st sub-group were represented by 6 admissions for mumps.

Malarial Fevers.—201 admissions are recorded with 1 death, the admission ratio, 131·8 per 1000, being above the previous year's rate and the average rate by 24·6 and 32·7 respectively. Of the cases, 125, or 126·4 per 1,000, occurred in Jamaica, 5 being returned as ague, and 120, 1 fatal, as remittent fever. In the Barbados Command 76 cases were admitted, 46 of ague, and 18 of remittent fever at St. Lucia, and 3 of ague and 46 of remittent fever at Barbados, the rate of prevalence being 141·8 per 1,000.

Venereal Diseases.—The admissions for *primary syphilis* were 170 in number, being in the ratio of 111·5 per 1,000, which is above the corresponding rate in the previous year and the average rate by ·8 and 10·9 respectively. Of the cases 139, or 140·5 per 1,000, were admitted in Jamaica, and 31, or 57·8 per 1,000, in the Barbados Command. Including the sickness from simple venereal ulcer, which caused 72 admissions, and the constant sickness of 6·17 men, the admission ratio for primary venereal sores was 158·7, which is lower than the corresponding rate in 1895 and than the average rate for the preceding ten years by 22·1 and 35·2 respectively; the constantly sick rate was 16·23 per 1,000, being higher than in the previous year by ·57, but below the average rate by ·37. All the sickness from simple venereal ulcer occurred in

West Indies.

the Barbados Command, the admission rate for primary venereal sores being 192·1 and the constantly sick rate 16·78, as compared with 206·2 and 16·70 per 1,000 respectively in 1895.

The admissions in the West Indies, as a whole, for *secondary syphilis* numbered 93, and 11·35 men were constantly sick, being in the ratios of 61·0 and 7·44 per 1,000, which are higher than the corresponding rates in the previous year by 27·3 and 3·92, and than the average ratios for the preceding 10 years by 15·4 and 2·96 respectively. In Jamaica the admission rate was 69·8 and the constantly sick rate 9·02 per 1,000, as compared with 32·7 and 3·72 in the previous year. In the Barbados Command the ratio of admission equalled 44·8 and the constantly sick rate 4·53 per 1,000, as compared with 35·4 and 3·12 per 1,000 respectively in 1895. *Gonorrhœa* caused 210 admissions in all, and 17·29 men were constantly sick with this disease. The admission ratio was 137·7, and the constantly sick rate 11·34, per 1,000. Compared with corresponding ratios in the previous year there is a decrease of 25·6 in the admission rate and an increase of ·63 in the constantly sick rate, while, compared with the average rates for the preceding ten years, a decline of 26·5 is observed in the former, and an increase of ·91 in the latter rate. In Jamaica alone the ratio of admission was 147·6 and the constantly sick rate 13·07 per 1,000, as compared with 166·8 and 12·45 in 1895. In the Barbados Command the admission ratio was 119·4 and the constantly sick rate 8·15 per 1,000, as compared with 156·2 and 7·29 respectively in the preceding year. Including all forms of venereal disease, the total admission ratio in the West Indies was 357·4 per 1,000, which is lower than the corresponding rate in the previous year by 20·4, and than the average rate of ten years by 46·3. The total amount of constant inefficiency on account of these diseases was 35·01 per 1,000, which is higher than the similar rate in the previous year by 5·12, and than the average rate for ten years by 3·50. Taking Jamaica alone, the total admission rate for all forms of venereal disease was 357·9, and the total amount of constant inefficiency on this account, 38·01 per 1,000, as compared with 367·4 and 31·29 respectively in the preceding year. In the Barbados Command the total admission rate was 356·3 and the total constantly sick rate 29·46 per 1,000, the corresponding rates in the previous year having been 397·8 and 27·11 per 1,000 respectively.

One case of *alcoholism* is returned, and there were 3 admissions for *debility*.

Rheumatism was the cause of 54 admissions, equal to a ratio of 35·4 per 1,000, which is lower than in the previous year and than the average rate by 28·4 and 25·1 respectively. The admission rate in the Barbados Command was 67·2 and in Jamaica 18·2 per 1,000. Of the cases, 17 were returned as rheumatic fever. There was no death.

Tubercular Diseases.—There were 20 admissions and 5 deaths, equal to ratios of 13·1 and 3·28 per 1,000, the former being lower than that for 1895 by ·9, but 4·0 in excess of the average rate for the ten years 1886–95; while the latter is higher in both comparisons by ·48 and ·23 respectively. All the cases were due to tubercular disease of the lung, and occurred as follows:— 14 with 1 death in Jamaica, and 6 with 4 deaths in Barbados.

The cases included under *other diseases* of Group D. were 2 of scrofula, and one each of malignant and non-malignant new growths and anæmia.

LOCAL DISEASES.—*Diseases of the Nervous System* caused 22 admissions, or a ratio of 14·4 per 1,000, which is higher than the previous year's rate and than the decennial average by 6·7 and 3·4 respectively. The admissions comprised 7 each for neuralgia and epilepsy, 4 for paralysis, 3 for dementia, and 1 for spasm of muscle. Of these cases 16 occurred in Jamaica.

Diseases of the Eye.—43 admissions are recorded, the ratio being 28·2 per 1,000, which is higher than that of the previous year by 1·6. In Jamaica there were 35 cases and in Barbados 8; most of the admissions were for conjunctivitis.

Diseases of the Ear caused 18 admissions, all but 5 being in Jamaica.

Diseases of the Circulatory System.—29 admissions are recorded; the ratio, 19·0 per 1,000, is higher than that of the previous year and than the average rate by 9·9 and 6·2. Of the cases, 8 were cases of valvular disease of the heart, six of which occurred in Jamaica, and one each in Barbados and St. Lucia;

West Indies. the remaining admissions were mostly for palpitation. There were 3 deaths, viz., one each from pericarditis and abdominal aneurysm in Barbados, and one from valvular disease of heart in St. Lucia.

Diseases of the Respiratory System caused 87 admissions, the ratio, 57·0 per 1,000, being above the previous year's rate and the average rate by 17·1 and 6·4 respectively. 60 admissions occurred in Jamaica, 47 for bronchitis, 4 each for pneumonia and pleurisy, 3 for hæmoptysis, and 2 for asthma; in Barbados there were 4 cases of bronchitis, 2 of pleurisy, and 1 of pneumonia, and in St. Lucia 12 of bronchitis, 7 of pneumonia, and 1 of pneumonic phthisis. Six deaths occurred, two from pneumonia and one from pneumonic phthisis in both Jamaica and St. Lucia.

Diseases of the Digestive System.—81 admissions are recorded, the ratio, 53·1 per 1,000, being below that of the preceding year and the average rate by 10·7 and 15·9. 53 cases, or 53·6 per 1,000, occurred in Jamaica, and 28, or 52·2 per 1,000, in the Barbados Command. Among the former were 22 cases of affections of the mouth and throat, 18 of diarrhœa, and 4 each of hernia and hepatic disorder, and among the latter 7 of mouth and throat affections, and 13 of colic. No death occurred.

Diseases of the Lymphatic and Glandular System were the cause of 33 admissions, equal to a ratio of 21·6 per 1,000, which is lower than the previous year's rate by 12·1. There were 23 admissions in the Barbados Command and 10 in Jamaica. Of 4 admissions for *diseases of the urinary system,* all in Jamaica, 3 were due to hæmaturia and 1 to retention of urine. *Diseases of the generative system* caused 107 admissions, of which 72 were for simple venereal ulcer, 17 for orchitis, and 11 for stricture of urethra, the ratio, 70·2 per 1,000, being below the previous year's and the average rate by 22·9 and 49·5 respectively. For *diseases of the organs of locomotion* there were 4 admissions and 1 death, all in Jamaica, the cause of death being lumbar abscess. *Diseases of the connective tissue,* with 25 admissions, gave a ratio of 16·4 per 1,000, which is lower than that for 1895 and than the ten years' average rate by 13·7 and 17·0. There were 77 admissions for *skin diseases,* the equivalent ratio being 50·5 per 1,000, as compared with 75·7 in the previous year and 82·5 the average rate.

Poisons.—One mild case of opium poisoning occurred in Jamaica, a man taking laudanum whilst suffering from dementia.

Injuries.—There were 115 admissions and 1 death. The admission rate was 75·4 per 1,000, which is above that for 1895 by 1·1, but below the average for the ten years by 4·4. The ratio in Jamaica was 69·8, and in the Barbados Command 85·8 per 1,000. The death occurred at Port Royal, Jamaica, and was due to drowning.

Invaliding.—The number of men discharged during the year as medically unfit for further service was 64, being in the ratio of 41·97 per 1,000, which is higher than the corresponding rate in the previous year and the decennial average rate by 4·83 and ·22 respectively. In the Barbados Command the number of men invalided was 9, or 16·79 per 1,000, as compared with 14·58 in the preceding year, and in Jamaica the number was 55, or 55·61 per 1,000, as compared with 48·57. The principal causes of invaliding were tubercle of the lung 16 cases, secondary syphilis 14, epilepsy 5, ophthalmic affections 5, valvular disease of heart and palpitation 4 each, dementia 3, and scrofula and asthma 2 cases each.

Women and Children.—The average strength of women was 80, with 52 cases of illness, and the average strength of children 74, with 83 cases of illness, 2 of which proved fatal. There was no death among the women. The two deaths among the children were due to debility.

Vaccination and Small-pox.—There were no cases of small-pox during the year. In Barbados, of two cases of arm-to-arm re-vaccinations, one in a man and the other in a child, the latter was a failure. There were 3 primary vaccinations with preserved lymph amongst children, all failures. Of 11 re-vaccinations amongst the men with preserved lymph 9 were failures, of 5 amongst women 4 failed, and of 3 amongst children all were failures. In Jamaica there were 64 primary vaccinations with preserved lymph amongst the men and 14 amongst the children, the failures being 8 in the former and 9 in the latter. Of 237 re-vaccinations with preserved lymph amongst the men 106 were failures.

VII.—ON THE HEALTH OF THE TROOPS SERVING IN WESTERN AFRICA.

Sickness and Mortality.

I.—European Troops.

West Africa.

The European troops consisted of the officers serving in the Command, the European non-commissioned officers of the West India Regiment, and the non-commissioned officers and men of the Royal Artillery and the Royal Engineers, the latter only remaining on the coast during the dry season from November to June.

The average strength of the non-commissioned officers and men was 53, and there were 165 admissions into hospital, equal to a ratio of 3113·2 per 1,000, which exceeds the corresponding rate in the previous year by 369·0. Of the admissions, 102 were for remittent fever, 12 for venereal disease (including 3 for simple venereal ulcer), 11 for debility, 4 for alcoholism, 2 for dysentery, and 2 for rheumatism. There were 3 deaths, (including 2 invalids who died after leaving the Command); 2 of the deaths were from remittent fever and the third was from dysentery. 20 men were invalided, 5 for remittent fever, 5 for debility, 2 each for dysentery, primary syphilis, and hepatitis, and 1 each for rheumatism, congestion of brain, epilepsy, and valvular disease of the heart. The average strength of officers was 26, and there were 63 cases of illness, including 39 of remittent fever, 4 of debility, and 3 of ague, the ratio, 2423·1 per 1,000, being above that recorded for the preceding year by 152·8. There was no death, but 9 officers were invalided, 6 on account of remittent fever, 2 for debility, and 1 for boils.

II.—Non-European Troops.

The average strength of non-commissioned officers and men was 969, of whom 945 were stationed at Sierra Leone, and 24 at Cape Coast Castle. The non-European troops serving on the West Coast during the year consisted of the Sierra Leone Company, Royal Artillery, the 2nd Battalion West India Regiment, and a detachment of the West India Fortress Company, Royal Engineers.

The more important of the statistics of sickness and mortality are given in the following table:—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent to West Indies.	Finally Discharged		Admissions.	Deaths.	Invalids sent to West Indies.	Invalids finally Discharged.	Constantly Sick.
969	2,015	15	—	15	10	27	97·57	2079·5	15·48	10·32	27·86	100·69

Compared with corresponding statistics in the previous year, a decrease of 202·4 has occurred in the ratio of admission, but there is an increase of 3·47 in the death rate, and one of 3·70 in the constantly sick rate. In comparison

West Africa. with corresponding average ratios for the preceding ten years the admission and constantly sick rates have increased by 130·1 and 13·91 respectively, but the mortality rate has decreased by 5·35. The average sick time to each soldier was 36·85 days, which is longer than the average sick time in the previous year and for the decennial period by 1·45 and 5·18 days respectively. The average duration of each case of sickness was 17·72 days, which is in excess of the similar period in the previous year by 2·21 days, and of the decennial average period by 1·47 days.

The admissions, mortality, invaliding, &c. arranged according to the different groups and orders of diseases are shown in Abstract VIII.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.—Dysentery* was the cause of 6 admissions, equal to a ratio of 6·2 per 1,000, which is higher than that in the previous year by 5·3, but below the average rate of the preceding ten years by 11·0.

Malarial Fevers caused 1,286 admissions, equal to a ratio of 1327·2 per 1,000, which is lower than the corresponding rate in the preceding year by 232·9, but above the decennial average rate by 361·4. The average number constantly sick from these fevers was equal to a ratio of 33·67 per 1,000, as compared with 42·45 in the previous year and 26·21, the decennial average rate. Of the total number of cases 1,267 were returned as remittent fever, 16 as ague and 3 as malarial cachexia. There were 5 deaths due to remittent fever. The great prevalence of these fevers is attributed to a particularly unhealthy season, such seasons occurring at irregular intervals, and in some cases depending on the rainfall.

Venereal Diseases.—Under the head of *primary syphilis* 74 admissions are returned, being in the ratio of 76·4 per 1,000, an increase of 58·8 on the previous year's rate, and one of 31·5 on the average rate of the preceding ten years. Adding the sickness for simple venereal ulcer, which caused 59 admissions and 5·22 constantly sick, the ratio of admission for primary venereal sores was 137·2 per 1,000, which differs from the rate in the previous year by an increase of 5·0, and from the average rate for the ten years by an increase of 33·0. *Secondary syphilis* caused 50 admissions, or 51·6 per 1,000, which is above the ratio in the preceding year by 1·7, and above the decennial average rate by 3·3. The admissions for *gonorrhœa* numbered 92, and were in the ratio of 94·9 per 1,000, or 26·2 and 40·7 below the previous year's and the average rates respectively. Including all forms of venereal disease, the admission ratio amounted to 283·7 per 1,000, being lower by 19·5 than the corresponding rate in the preceding year, and than the decennial average rate by 4·4. The total amount of constant inefficiency on account of these diseases was equal to 23·87 per 1,000, which is lower than the corresponding rate in 1895 by 3·85, but higher than the decennial average rate by 2·12.

Debility.—11 admissions are returned, or 11·3 per 1,000, as compared with 2·8 in 1895, and 18·6, the average rate.

Rheumatism was the cause of 59 admissions, or 60·9 per 1,000, an increase of 5·4 on the rate in the previous year, but below the decennial average rate by 21·9. No case of rheumatic fever occurred.

Tubercular Diseases.—15 admissions and 5 deaths are returned, being in the ratios of 15·5 and 5·16 per 1,000 respectively, as compared with 14·8 and 3·70 in the preceding year, and 10·7 and 4·22, the decennial average rates. All the admissions and deaths were due to tubercle of the lungs. The remaining admissions in this group were 2 for non-malignant new growth, and one each for malignant new growth, scrofula and anæmia.

LOCAL DISEASES.—*Diseases of the Nervous System.*—The admissions under this head were 6 in number, being in the ratio of 6·2 per 1,000, an increase of 1·6 on the previous year's rate, but below the average rate for the preceding 10 years by 7·1. Among the admissions were 2 for mental disease. There was one death from inflammation of the cerebral membranes.

Diseases of the Eye caused 11 admissions, or 11·3 per 1,000, which is below the corresponding rate in the preceding year by 3·5 and is 10·8 below the average rate. Eight of the admissions were for conjunctivitis.

Diseases of other Organs of Special Sense.—There were 3 admissions for aural disease as compared with 2 in the previous year.

West Africa.

Diseases of the Circulatory System.—Twenty admissions are recorded, the ratio, 20·6 per 1,000, being above the rates for the previous year and for the decennial period by 15·1 and 5·0 respectively. There were 10 cases of valvular disease of the heart and 10 of palpitation. There was one death, (out of hospital), from thrombosis.

Diseases of the Respiratory System.—There were 34 admissions and 2 deaths, being in the ratios of 35·1 and 2·06 per 1,000 respectively. The admission ratio shows an increase of 3·7 as compared with the previous year, but is below the decennial average rate by 23·0. The cases included 25 of bronchial affections and 2 of pneumonia. One of the deaths was due to pneumonic phthisis and the other to hæmorrhage of the lungs.

Diseases of the Digestive System caused 57 admissions and 1 death. The admission ratio, 58·8 per 1,000, shows an increase of 20·0 on the previous year's rate, but a decrease of 11·0 on the corresponding rate for the preceding 10 years. Throat affections and diarrhœa were the principal causes of admission. The death was due to abscess of the liver.

Diseases of the Lymphatic and Glandular System caused an admission rate of 31·0 per 1,000, or 8·7 below the previous year's rate and 15·5 below the average rate.

Diseases of the Generative System were at the rate of 72·2 per 1,000, a decline of 72·9 compared with the previous year's rate and of 14·9 compared with the decennial average rate. There were 8 admissions for orchitis, 2 for stricture of urethra, 1 for hydrocele, and the remaining 59 admissions were for simple venereal ulcer.

Diseases of the Organs of Locomotion.—Fifteen admissions are recorded, synovitis being the principal cause. The admission rate, 15·5 per 1,000, shows an increase of 12·7 as compared with the previous year, and is 4·4 above the average rate of the preceding ten years.

Diseases of the Connective Tissue, with a ratio of 33·0 per 1,000, show a decrease in both comparisons. Nineteen of the admissions were for inflammation and 13 for abscess of the connective tissue.

Diseases of the Skin caused 86 admissions, equal to a ratio of 88·8 per 1,000, which is higher by 22·2 than the rate in the previous year, but lower than the decennial average rate by 54·0. The principal causes of admission were ringworm, ulcers and boils.

Injuries were 47 in number, equal to a ratio of 48·5 per 1,000, or lower than the preceding year's and average rates by 8·3 and 25·4 respectively. The chief causes of admission were wounds and contusions.

Invaliding.—The number of men invalided to the West Indies for change of climate or discharge was 10, equal to a ratio of 10·32 per 1,000, which is lower than the corresponding rate in the previous year by 43·28, and than the average rate of the preceding 10 years by 28·11. The number of men finally discharged the service by invaliding was 27, being at the rate of 27·86 per 1,000, an increase of 26·01 on the previous year's rate, and of 14·91 on the decennial average rate. The principal disabilities necessitating discharge were constitutional syphilis 6 cases, tubercular disease 4, and diseases of the respiratory system 3 cases.

Women and Children.—The average strength of women was 36, and there were 84 attacks of illness, equal to a ratio of 2333·3 per 1,000, which is below the corresponding rate in the previous year by 1090·9. Remittent fever was the principal cause of sickness, there being 38 cases. The average strength of children was 28, and the cases of sickness were 63 in number. The ratio of admission was, therefore, 2250·0 per 1,000, which is greater than in the preceding year by 350·0. Malarial fevers were the cause of 31 of the cases, there being 28 cases of remittent fever, and 3 of malarial cachexia. One death occurred and was attributed to immaturity at birth.

Vaccination and Small-pox.—No cases of small-pox occurred amongst the troops in the Command during the year. All vaccinations were from preserved lymph, and out of 66 operations for re-vaccination among soldiers 58 were failures. Among children there were 5 primary vaccinations, all failures; and out of 9 operations for re-vaccination all but 2 were failures.

West Africa.

Sanitary Conditions.—The Senior Medical Officer (Surgeon-Major J. Hickman) reports that there was a considerable decrease in sickness, attributable probably to the fact that the West India Regiment on tour in the Command was in its second year of service and more acclimatized. The sanitation generally of Sierra Leone is considered good, the water supply pure and abundant, and the barracks and hospitals in good sanitary condition. It is noted, however, that there is no gymnasium or facilities for outdoor gymnastic exercises, that the hospital accommodation is altogether insufficient, and increased accommodation is urgently required, and that quarters for the hospital sergeant have not yet been erected. The new ablution room and surgery at Tower Hill hospital were taken into use during the year and are much appreciated. No cases of enteric fever have been observed in the command.

One half battalion of the 2nd West India Regiment remained in the Gold Coast Colony and Ashanti, on the conclusion of the Ashanti expedition, until the 2nd March 1896, when the troops returned to Sierra Leone.

The strength left at Kumassi on the 22nd January 1896 averaged 5 officers and 117 non-commissioned officers and men. They departed for Cape Coast Castle on 13th February and the strength was increased at Kwisa on the line of march to 7 officers and 183 non-commissioned officers and men. "Almost all the sickness amongst them was caused by malarial fever. The disease as a rule yielded to treatment in two or three days, but showed the usual tendency to recur. The only other cases of sickness were one case of diarrhœa, one wound, and one of synovitis."

The factors causing the large proportion of admissions for malarial fever, as compared with other diseases, are stated to have been "fatigue and exposure incident to a march of 150 miles in the African bush, the presence of swamps in the neighbourhood of the town (Kumassi), the digging up of the ground in the central square, necessitated by the building of the fort, and, lastly, the fact of these troops having already served one year at Sierra Leone before being sent to the Gold Goast." The detachment arrived at Cape Coast Castle on February 26th, the average length of each march being 10 to 11 miles. The numbers requiring carriage in hammocks varied from 8 to 15.

With regard to sanitary conditions, the medical officer in charge at Kumassi and on the line of march, Surgeon-Captain C. L. Josling, reports as follows:—"The troops remaining in Kumassi occupied temporary huts erected near the central square of the town. A number of native huts in the vicinity were pulled down to provide free circulation of air. Beds, of the guardroom type, made of split bamboo and raised about 2 feet from the ground were put up in these huts. The huts themselves consisted of a bamboo framework, roofed with palm and banana leaves, the sides also being closed in with the same materials. These huts were fairly cool, and answered the purpose in the dry season, but would not afford much protection from heavy rain. A temporary mess hut and quarters for the officers were also built, facing the square, and to the north of the men's huts.

"Trench latrines were made about 50 yards away from the huts, and on a lower level.

"A native house situated to the north of the central square and about 300 yards from it, and providing accommodation for about 15 men, was made use of as a hospital; it was one of the largest and best built houses in that quarter of Kumassi, and had formerly been occupied by the Bearer Company, Medical Staff Corps.

"Trench latrines were dug in the vicinity.

"Water was obtained from springs situated to the west of the town, and about ½ of a mile away. It was apparently good, but was always boiled and generally filtered before being used.

"The rations supplied to the troops were of very good quality and sufficient in quantity; they consisted of corned beef and a mixed ration of meat and vegetables (Maconochie's ration), biscuit and sometimes bread, chocolate, &c. A few days after the entry of the troops into Kumassi a market was established, and plenty of fresh fruit and vegetables, such as bananas, pineapples, yams, &c., were procurable.

West Africa.

" For the first few marches out of Kumassi the troops were quartered in the
" villages, but, from Kwisa, the temporary huts erected for the expeditionary
" force were made use of; these huts were constructed in the same manner as
" before described. The water supply at the different camps varied very much
" in quality. At Kwisa, about 35 miles from Kumassi, it was of excellent
" quality, near the camp, and plentiful, being drawn from a stream which had
" its source high up in the neighbouring Adansi hills; at some other camps,
" however, it was carried in earthen vessels from some distance, was brown in
" colour, depositing a brown sediment, due to contamination with decaying
" vegetable matter. In all cases the water was boiled, and when possible,
" filtered. A Morris filter was used.

"The weather with the exception of a few showers was dry. On several
" days the harmattan wind was very perceptible."

A small detachment remained at Cape Coast Castle on the departure of the expeditionary force on the 8th February, and a non-dieted hospital was kept open from that date till the final departure of the non-European troops for Sierra Leone on the 2nd March. The Senior Medical Officer (Surgeon-Major E. Wilson, C.M.G.) reports that the average annual strength during that period was for Europeans 2 officers and 2 non-commissioned officers and men, with an admission ratio of 5,000 per 1,000 for the former and 3,000 per 1,000 for the latter, chiefly cases of malarial fever. There were no deaths. The non-European troops had an average annual strength of 24, with 116 admissions during the 24 days, equivalent to an admission ratio of 4833·3 per 1,000. There was one death, equal to 41·6 per 1,000 of strength. 102 of the admissions were for malarial diseases, and the death was due to pneumonia supervening on an attack of malarial fever. There was no venereal disease nor any admission directly or indirectly due to intemperance. The troops were quartered in Cape Coast Castle, and the hospital was practically the former base hospital of the Ashanti Expeditionary Force situated on a hill ¾ miles from the town. The sanitary condition of the town is reported to have been bad, and the water supply—rain-water collected in tanks—indifferent in quality and insufficient in quantity. Pasteur-Chamberland filters were used, and acted satisfactorily. Other sanitary conditions were considered satisfactory.

VIII.—ON THE HEALTH OF THE TROOPS SERVING IN SOUTH AFRICA AND AT ST. HELENA.

Sickness and Mortality.

South Africa and St. Helena.

The average strength of the warrant officers, non-commissioned officers and men serving in the Command during the year, exclusive of those engaged in active operations in Matabeleland and Mashonaland, was 4,412, and of these 230 were stationed at St. Helena.

The troops stationed in South Africa throughout the year were the 7th Hussars; 10th Mountain Battery; 25th and 26th Companies, Western Division, Royal Artillery, and the District Establishment, Royal Artillery; the 29th Company, Royal Engineers; the 2nd Battalion, West Riding Regiment; the 2nd Battalion, York and Lancaster Regiment (half battalion), and detachments of Army Service Corps, Medical Staff Corps, Army Ordnance Corps, and Garrison Staff.

Arrivals during the year consisted of the 1st Battalion, Leicestershire Regiment, from the West Indies in January; the 1st Battalion, Middlesex Regiment, from England in May; the 2nd Battalion, King's Royal Rifle Corps, from Malta, and a detachment of Mounted Infantry, from England, in August; the 9th Lancers from England in September; and the 1st Battalion, King's Royal Rifle Corps, from India late in December.

The 1st Battalion, Royal Highlanders left the Command for India, and a half battalion of the 2nd Battalion, York and Lancaster Regiment, for Mauritius, in January.

St. Helena was garrisoned by a detachment of the Royal Artillery, and a company of the 1st Battalion, Leicestershire Regiment.

The subjoined table shows the more important statistics of sickness and mortality relating to the troops in South Africa and in St. Helena, and also those for the whole Command.

1896.	Average Strength.	Admissions.	Deaths			Invalids	
			In the Command.	Of Invalids.	Total.	Sent Home.	Finally discharged.
South Africa -	4,182	3,667	21	—	21	62	41
St. Helena -	230	143	—	—	—	2	—
Total -	4,412	3,810	21	—	21	64	41

(*continued.*)

1896.	Average constantly Sick.	Ratio per 1,000 of Strength.				
		Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.
South Africa -	232·30	876·9	5·02	14·83	9·80	55·55
St. Helena -	7 81	621·7	—	8·70	—	33·96
Total -	240·11	863·5	4·76	14·50	9·29	54·42

South Africa and St. Helena.

Comparing the ratios for the whole Command with those given in a similar table in the Report for 1895, it is observed that a general decrease has occurred, equal to 66·6 per 1,000 in the admission rate, 1·26 in that of mortality, 2·98 in invalids sent home, 3·32 in invalids finally discharged, and 5·10 in the ratio constantly sick. In comparison with average ratios for the preceding ten years there is an increase of 1·6 per 1,000 in the admission rate, but a decline of 1·84 and ·83 respectively in the ratios of mortality and constantly sick. The average sick time to each soldier was 19·92 days, which is shorter than in the previous year by 1·80, and fractionally less than the decennial average period, while the average duration of each case of sickness, 23·07 days, was shorter in both comparisons by about a quarter of a day.

Taking South Africa alone, the admission, death, and constantly sick rates are all lower than in 1895 by 72·4, ·47, and 5·55 per 1,000 respectively. At St. Helena there was also less sickness than in the previous year, the admission ratio having declined by 15·5, the death rate by 13·95, and the constantly sick rate by 1·53.

In Abstract XXV. will be found the principal statistics of sickness and mortality among the different corps which served in the Command during the year. Omitting corps whose average strength was less than 100 men, the highest admission ratio was 1191·1 per 1,000 in No. 10 Mountain Battery, Royal Artillery, at Pietermaritzburg; the next highest ratio being 1044·1 in the half battalion of the 2nd Battalion, York and Lancaster Regiment, at Cape Town and Wynberg. Other high admission ratios were 1036·6 in the 1st Battalion, Middlesex Regiment, 1026·8 in the 26th Company, Western Division, Royal Artillery, and 1006·6 in the 9th Lancers, the two former being at Cape Town and Wynberg, and the cavalry regiment at Pietermaritzburg. The lowest ratio of admission was 648·6 per 1,000 in the 2nd Battalion, King's Royal Rifle Corps, at Cape Town and Wynberg after arrival from Malta in August, the next lowest being 809·3 per 1,000 in the 1st Battalion Leicestershire Regiment at Wynberg. The highest ratio of mortality was 19·11 per 1,000 which occurred in both the 7th Hussars and the 10th Mountain Battery, Royal Artillery; No. 26 Company, Western Division, Royal Artillery, following with 17·86. The lowest ratio was 2·11 in the 1st Battalion, Leicestershire Regiment. The ratio of constant inefficiency from sickness was highest, 89·36 per 1,000, in the 10th Mountain Battery, Royal Artillery, at Pietermaritzburg, and lowest, 45·43, in the Mounted Infantry at Wynberg and Pietermaritzburg.

With reference to the influence of age on the sickness and mortality among the troops, it is observed that the highest ratio of sickness was 1036·4 per 1,000 among men under 20 years of age, falling in the succeeding age periods to 1018·7 among men between 20 and 25, 607·5 among those between 25 and 30, 459·8 among those between 30 and 35, and 250·0 among men of more than 35 years of age. In 1895 the results of sickness according to age were similar. There was no mortality among men under 20 years of age, but 15 deaths, or 5·84 per 1,000, occurred among those between 20 and 25; 2 deaths, or 1·67 per 1,000, among men between 25 and 30; 3, or 13·39 per 1,000, in men between 30 and 35; and 1 death, or 10·42 per 1,000, in a man of more than 35 years of age. In the preceding year mortality was highest among men of 35 years of age and upwards, and lowest among those between 30 and 35. With regard to service in the Command, the admission rate among men in their first year was 850·1 per 1,000, rising to 1483·8 among those in their second year, after which the rate declined to 617·8 among those in their third year, 420·0 among those in their fourth year, and 360·9 among men who had completed four or more years in the Command. In the previous year the highest rate occurred among men in their first, and the lowest among those in their third year. There were 13 deaths, or 4·61 per 1,000 among men in their first year; 2, or 3·23 per 1,000, among those in their second; 2, or 3·96, among those in their third; and 4, or 20·00, among men in their fourth year of service in the Command. In 1895 the highest mortality rate was also amongst men of four years' service and upwards, and the lowest among those in their second year.

The principal statistics of sickness and mortality arranged according to the different groups and orders of diseases are given in Abstract IX.

South Africa and St. Helena.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—The admissions for *eruptive fevers* were 4 for measles, and 1 each for epidemic rose-rash and scarlet fever.

For *enteric fever* there were 45 admissions and 10 deaths, equal to ratios of 10·2 and 2·27 per 1,000 respectively, which is higher by 1·1 and 1·41 than in 1895, and by 1·4 and ·61 than the average rates for the preceding ten years. The per-centage of mortality to attack was 22·2, as compared with 9·4 in the previous year, and with 18·7 during the previous ten years. The distribution of the cases was as follows:—23, with 6 deaths, at Pietermaritzburg; 11, with 3 deaths, at Cape Town; 6, with 1 death, at Wynberg; 3 non-fatal cases at Eshowe, and 2 at Simon's Town. Of those at Pietermaritzburg, 6 were admitted in January, 3 in February, 1 in March, 2 in April, 1 in July, 2 in September, 1 in October, 5 in November, and 2 in December. The officer in medical charge of the station hospital reports that it is extremely difficult to assign a definite cause for the occurrence of the disease; that the drinking water was analysed several times and found to be good and free from sewage contamination, while only condensed milk of good quality was used by the troops. It is stated that in several cases the disease appeared to be due to the consumption of water from streams in the neighbourhood while the men were walking out, or on field days, and that enteric fever was prevalent among the civil population, the Natal police, for example, suffering considerably during the year. Of the 11 cases at Cape Town, 6 were in men of the 2nd Battalion, King's Royal Rifle Corps, which arrived from Malta on August 5th, 3 of the cases being admitted on the 9th, 10th, and 15th of that month. The disease was probably contracted before arrival, but in no instance could the origin be satisfactorily traced. At Wynberg the officer in medical charge reports that the origin of 5 cases is quite uncertain, but that the 6th (and fatal) case was probably contracted in Natal. It appears probable that of the 3 cases at Eshowe, two at least were due to drinking water from streams while fishing or engaged on military training, but there is an absence of facts which might throw light on the prevalence of this disease in South Africa and especially in Natal.

Other Continued Fevers.—Under this heading there were 153 cases, or 34·7 per 1,000, exceeding the ratio for the previous year by 2·9, but below the decennial average rate by 2·5. All were cases of simple continued fever.

Dysentery caused 59 admissions and 1 death. The ratio of prevalence is 13·4 per 1,000, which is 5·1 higher than that of 1895, and 7·3 higher than the average for the preceding ten years. 51 of the cases, including the fatal case, occurred at Pietermaritzburg. With few exceptions they were mild in character.

Other diseases in the 1st sub-group of general diseases are represented by one case of influenza and one of diphtheria, the latter being reported from St. Helena, and of a mild type.

For *malarial fevers* there were 39 admissions, the ratio, 8·8 per 1,000, being below that for 1895 by 7·8, and 14·2 less than the average rate. The cases comprised 25 of ague, 12 of remittent fever, and 2 of malarial cachexia. 36 of the admissions occurred at Pietermaritzburg, and were mostly due to disease previously contracted in India or on active service in Mashonaland.

Septic Diseases.—2 cases of erysipelas are recorded.

Venereal Diseases.—There were 304 admissions for *primary syphilis*, viz., 243 in Cape Colony, 57 at Pietermaritzburg, 2 at Eshowe, and 2 at St. Helena, the ratio per 1,000 being 68·9 as compared with 84·3 in 1895, and with a decennial average of 87·1. If to this be added the sickness from simple venereal ulcer, for which there were 22 admissions and 2·64 men constantly sick, the admission ratio for primary venereal sores was 73·9 per 1,000, which is lower than the previous year's rate by 14·4, and than the decennial average by 38·2. *Secondary syphilis* gave 145 admissions, comprising 88 in Cape Colony, 50 in Natal, 3 at Eshowe, and 4 at St. Helena, or a ratio of 32·9 per 1,000, as compared with 47·3 per 1,000 in the previous year, and with 55·6 for the decennial period. *Gonorrhœa*, with 486 admissions, viz., 335 in Cape Colony, 125 in Natal, 7 at Eshowe, and 19 at St. Helena, gave a ratio of 110·1 per 1,000, which is lower than that for the previous year by 38·0, but higher than the average for the preceding ten years by 4·8.

Taking all these forms of venereal disease together the total admission ratio was 216·9 per 1,000, a ratio lower than the previous year's ratio by 66·8, and than the decennial average by 56·1. The total ratio of constant inefficiency from these diseases was 21·08 per 1,000, as compared with 27·71 in 1895 and 21·92 for the decennial period. There has been a considerable decline in venereal diseases in South Africa in 1896, and it is further noticed that these diseases affect the troops in Natal to a less extent than those in Cape Colony.

Parasitic Diseases were represented by 4 cases of tænia solium as compared with 13 in 1895. Tape worm is noted as being very common among the native followers, especially in Eshowe, Zululand, but during 1896 effective treatment employed during the previous year there is stated to have caused the disease to have almost entirely disappeared.

Debility, &c.—Under this heading there were 23 cases, or a ratio of 5·2 per 1,000, which is lower by 3·1 than in 1895 and by 8·1 than the decennial average.

Rheumatism caused 159 admissions, including 4 for rheumatic fever, the ratio, 36·0 per 1,000, being higher than in the year 1895 by 3·6, but below the decennial average by 2·8.

Tubercular Diseases accounted for 11 admissions and 2 deaths, all being cases of tubercle of the lungs. The ratio of sickness was 2·5 per 1,000, which is lower than in 1895 by 1·8, but only a fraction below the decennial average.

Under *other diseases* of Group D., 23 admissions are shown, all for non-malignant new growth.

LOCAL DISEASES.—*Diseases of the Nervous System* were the cause of 38 admissions, or a ratio of 8·6 per 1,000, which is less than the corresponding ratio in the preceding year by 2·0 and than the decennial average by a fraction. The cases included 15 of neuralgia, 11 of epilepsy, 5 of vertigo, 4 of mental disorder, and 1 each of locomotor ataxy, hemiplegia, and chorea.

Diseases of the Eye, with 52 admissions, gave a ratio of 11·8 per 1,000, as compared with 10·6 and 15·4 respectively for the previous year and for the decennial period. 28 of the admissions were cases of conjunctivitis. The majority occurred at Wynberg and Pietermaritzburg.

Diseases of other Organs of Special Sense caused 42 admissions, all but 2 being for aural affections. The ratio, 9·5 per 1,000, is identical with that for the previous year, but above the average rate by 1·3.

Diseases of the Circulatory System accounted for 25 admissions, equal to a ratio of 5·7 per 1,000, which is 7·8 below the preceding year's rate, and 5·0 below the decennial average. Among the cases treated were 16 of palpitation and 4 of varix. There was one fatal case of syncope, occurring after an operation under chloroform.

Diseases of the Respiratory System caused 113 admissions. The ratio, 25·6 per 1,000, was less than in the year before by 2·5, and than the average for the preceding ten years by 1·3. Bronchitic affections accounted for 94 of the cases, and, among the remainder, there were 7 of pneumonia and 4 of pleurisy. There were no fatal cases. Five of the pneumonia cases occurred at Pietermaritzburg.

Diseases of the Digestive System.—There were 591 admissions and 2 deaths. The admission rate, 134·0 per 1,000, is higher than in 1895 and than the decennial average by 6·0 and 35·9 respectively. Various forms of throat affection accounted for 265 of the cases. There were 124 admissions for diarrhœa, 55 for colic, 45 for dyspepsia, 38 for gum boil, 22 for piles, and 19 for hepatic disorders. Both deaths were due to abscess of the liver. The greatest proportion of the diseases in this group, including diarrhœa, occurred at Pietermaritzburg.

Diseases of the Lymphatic and Glandular System, with 96 admissions, gave a ratio of 21·8 per 1,000, which is lower than in 1895 by 1·4 and than the decennial average by 9·3. All the admissions, with the exception of 3 for inflammation of lymph vessels, were for inflammation of the glands.

For *diseases of the urinary system* there were 7 admissions with 3 deaths. The admission ratio was 1·6 per 1,000, or a fraction below the previous year's rate and 1·8 below the decennial average. The cases included 3 (two fatal) of Bright's disease, 1 (fatal) of nephritis, and 1 each of pyelitis, cystitis, and incontinence of urine.

South Africa and St. Helena.

Diseases of the Generative System.—85 admissions are returned, equal to a ratio of 19·3 per 1,000, as compared with 24·1 in the previous year and 44·2 for the decennial average period. In addition to the 22 cases of simple venereal ulcer previously referred to, there were 32 of orchitis, 21 of balanitis, 4 of hydrocele, 3 of stricture, 2 of varicocele, and 1 case of paraphimosis.

Under the heading of *diseases of the organs of locomotion* there were 58 admissions, including 41 for synovitis and 7 for flat feet. The ratio of admissions was 13·1 per 1,000, a fraction above that recorded for the previous year and 4·2 above the decennial average.

Diseases of the Connective Tissue caused 173 admissions, or a ratio of 39·2 per 1,000, which is higher than the rate for 1895 and for the decennial period by 8·0 and 11·0 respectively.

Diseases of the Skin accounted for 343 admissions, equivalent to 77·7 per 1,000, or 7·2 higher than the previous year's rate and 17·5 above that of the preceding ten years. The admissions included 93 for boils, 70 for ulcers, 53 for eczema, and 47 for whitlow. A comparatively large number of the cases of boils occurred in the small garrison at Eshowe, the medical officer in charge remarking that the cases, two of which were very severe, are often due to poisonous bites of ticks that swarm there.

Poisons.—Two admissions are recorded, one due to eating poisonous fungi and one to snake bite. The former occurred at Wynberg and the latter at Eshowe. Neither case was fatal.

Injuries.—Under the heading of general injuries 9 admissions are recorded, comprising 5 for sunstroke and 4 for multiple injury. The cases of sunstroke all occurred at Wynberg during a route march on a very hot day with no breeze. There was no death. Among 694 admissions for local injuries there were 223 for wounds, 158 for contusions, 141 for sprains, and 80 for blisters of feet. There were 2 deaths, one from concussion of the brain by fall from a horse, and the other from fracture of the skull by a blow with a stick. The ratio of admissions per 1,000 for all classes of injuries was 159·3, as compared with 139·5 in 1895 and 113·4 for the decennial period.

Invaliding.—There were 64 men invalided home during the year, the ratio, 14·50 per 1,000, being lower than that for the previous year by 2·98, and than the average for the decennial period by 10·05. Including one man discharged locally, invaliding was at the rate of 10·75 per 1,000 in the Cavalry, 23·47 in the Artillery, 21·28 in the Engineers, 14·16 in the Infantry, and 5·24 in other branches of the Service.

The number of men under 20 years of age invalided was 4, or 12·12 per 1,000; 40 of those invalided, or 15·58 per 1,000, were between 20 and 25; 17, or 14·23, were between 25 and 30; 3, or 13·39, were between 30 and 35, and 1 man, or 10·42 per 1,000, was over 35 years of age. In the previous year the highest rate of invaliding occurred amongst men under 20 years of age, and the lowest among men over 35. With regard to influence of years of service in the Command on the invaliding, 30 of those invalided, or 10·63 per 1,000, were in their first year; 19, or 30·65, were in their second year; 13, or 25·74, were in their third year; none were invalided in their fourth year, and 3, or 11·28 per 1,000, had been in the Command more than four years. In 1895 the highest rate was amongst men over four years in the Command, and the lowest among men in their second year. Of diseases causing invaliding, 9, or 2·04 per 1,000, were cases of secondary syphilis, and 6, or 1·36 per 1,000, cases of gonorrhœa, while among other causes nervous diseases accounted for 7 cases (including 2 cases of mental disorder), or 1·58 per 1,000, aural diseases 6 cases, or 1·36 per 1,000; tubercular disease of the lung 5 cases, or 1·13 per 1,000, and diseases of the skin and injuries each 4 cases, or ·91 per 1,000.

The number of men discharged from the Command during the year as medically unfit for further service was 41 (including the man discharged locally), equal to a ratio of 9·29 per 1,000, which is less than the ratio for the previous year by 3·32, and than the average for the preceding ten years by 5·73. The principal causes of discharge were nervous affections, 11 cases, or 2·49 per 1,000 (including 6 cases, or 1·36 per 1,000, of mental disorder); tubercular diseases, 5, or 1·13 per 1,000; diseases of the ear and injuries, 4 cases each, or ·91 per 1,000; and rheumatism and diseases of the organs of locomotion, each 3 cases, or ·68 per 1,000.

South Africa and St. Helena.

Officers.—There was an average strength of 162 officers with 81 admissions, equivalent to a sick rate of 500·0 per 1,000, as compared with 561·1 in the previous year. One death occurred, namely, from tubercle of lung. The admissions included 15 for injuries, 11 for throat affections, 7 for simple continued fever, 5 for dysentery, 5 for diarrhœa, and 4 each for malarial fever, rheumatism, dyspepsia, and hepatic affections. There was also one admission for enteric fever.

Women.—In an average strength of 251 women, there were 170 cases of sickness, and 2 deaths; the ratio of sickness being 677·3, and that of mortality, 7·97 per 1,000, as compared with 795·1 and 9·76 respectively in the previous year. Among the cases treated were 18 of throat affections, 15 each of debility, rheumatism, dyspepsia, and diseases of the generative system, 11 of neuralgia, 10 of simple continued fever, 8 of bronchitis, and 7 of diarrhœa. Four cases of enteric fever occurred, two at Wynberg and two at Cape Town, and both the deaths were due to this cause.

Children.—The average strength was 432, and there were 360 cases of sickness, with 18 deaths, equal to sick and mortality ratios of 833·3 and 41·66 per 1,000 respectively. The former ratio is lower by 93·5 and the latter higher by 13·88 than in 1895. The chief causes of sickness were bronchitis, 53 cases, diarrhœa 42, whooping cough 32, chicken-pox 26, simple continued fever 21, debility 19, dyspepsia 14, and measles and dysentery 10 cases each. Two cases of enteric fever occurred, one at Cape Town and the other at Wynberg, but there was no mortality from this cause. The deaths were 5 from diarrhœa, 4 from debility, 2 each from dysentery, convulsions, and pneumonia, and one each from measles, tubercle of intestine, and croup.

Vaccination and Small-pox.—No cases of small-pox occurred in the Command during the year. Vaccination is carried out by lymph obtained from the Government Bacteriological Institute at Graham's Town, and is reported to be usually very efficient and to keep well. All vaccinations were from this preserved lymph. 28 out of 87 primary vaccinations were failures, and of re-vaccinations 25 out of 75 failed.

Sanitary Conditions.—At Cape Town considerable improvements have been made during the year by the reconstruction of the main barracks, and by the provision of married quarters for the families. In previous years many of the families were obliged to live in hired lodgings in the town, and the Senior Medical Officer at Cape Town now reports that three new blocks, accommodating 25 families, have been occupied, and two more to accommodate 24 families are nearly completed. A new drainage system for Cape Town is also in course of construction, and is expected to be completed in 1897. The existing drainage system is reported to be inefficient. Enteric fever was prevalent amongst the civil population during the last quarter of the year. The dry system of conservancy is employed, the night soil being taken by railway to the country.

At Wynberg the medical officer in charge of troops points out that many of the married families live in hired quarters, distance two or three miles from the camp, and much inconvenience arises in the sanitary supervision of these quarters, as also from the want of a system of notification of infectious diseases amongst the civil population.

With regard to the general sanitary condition of the camp at Wynberg, the Principal Medical Officer refers to the difficulty of disposing adequately of the rain, ablution, and other surface water. "This could be satisfactorily dealt with," he writes, "when the garrison was limited to one battalion of, say, some 750 men, by surface drains leading into soakage pits, near which trees were planted to absorb the moisture, but the extremely limited area of ground available, owing to the large increase in number of men to 2,500, became waterlogged, and a nuisance was thus created. A scheme is now being tried of running most of the water into two disused wells, from which it is pumped at short intervals by means of a manual fire engine, and distributed over the cricket and parade grounds." He does not anticipate that this arrangement will be satisfactory for long, and suggests the reduction of the Wynberg garrison to the number for which there is barrack accommodation, viz., one battalion, and the removal of the rest of the troops to Graham's Town and King William's Town. He points

South Africa and St. Helena.

out that, unlike the climate of other parts of South Africa, Wynberg has a very heavy fall of rain during the four months of coldest weather, and believes that, during this wet season, men under canvas would suffer severely. Enteric fever was prevalent amongst the civil population at Wynberg. At Simon's Town minor sanitary improvements, such as the provision of automatic earth closets and new iron dustbins, were carried out. The local sanitary conditions there are reported to be far from satisfactory, there being an almost entire absence of proper drainage. The water supply is, however, good, from hill springs, and the health of the troops and of the surrounding civil population has been very good. The hospital is a non-dieted hospital, and stated to be in a bad situation, being built over a cemetery at the lowest part of the barracks.

The chief feature in the reports from Pietermaritzburg is the prevalence of enteric fever and dysentery there. The majority of the enteric fever cases occurred during the four summer months (November, December, January, and February). The disease was frequent amongst the civil population, and the Natal Mounted Police suffered considerably during the year. Milk, as a cause, is excluded, only condensed milk being used by the troops. The public water supply is stated to be good, and the general impression is that the disease is contracted by men drinking water from streams and watercourses in the neighbourhood of Pietermaritzburg when walking out and on field days. The dry-earth system of conservancy is in force, the night soil being buried about three miles from the camp. The contents of refuse and dung-pits are burned. The water supply is from the town reservoirs, and supplied to some quarters by service pipes from the main, but to the higher parts of the camp from a water tower, to which the supply is pumped by manual labour. The water supplied in this way is reported to be insufficient, as a rule, and water carts are also employed. The married quarters are not sufficient for the whole of the families, and a large number are quartered in hired houses scattered through the town. A new block consisting of four married quarters was constructed during the year. Other sanitary improvements consisted of the construction of two new latrines and an ablution room.

The sanitary condition of Eshowe, a small garrison with an average strength of 189, is reported as satisfactory. The hospital is conducted as a field hospital, and convalescents from Pietermaritzburg are sent there and recover rapidly, with the exception of cases of rheumatism and tubercle of lung, which are said to do badly. Two of the three cases of enteric fever, and two of the three cases of dysentery during the year are attributed to the drinking of water from dirty streams in the country. The water supply to the troops for drinking and cooking is rain water collected on the roofs, and stored in large iron tanks. Additional water is supplied for other purposes from a small pond fed by two streams near the camp, and distributed by galvanised iron water-carts daily. This supply is liable to be polluted during heavy rains by surface washings. The dry-earth system of conservancy is in force, the soil being buried in trenches about a mile from the camp.

The sanitary condition of barracks and their surroundings in St. Helena is reported as satisfactory, and the health of the troops during the year good With the exception of an isolated and mild case of diphtheria, no special disease was noted. The case of diphtheria was attributed to probable contagion in James Town, where a form of sore-throat called "white sore-throat" is sometimes prevalent. The water supply is from springs, and is reported to be good and sufficient. The system of conservancy is also regarded as efficient, and consists of discharging the soil into the sea over the cliff 600 feet high.

IX.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF MAURITIUS.

Sickness and Mortality.

Mauritius.

The average strength of warrant officers, non-commissioned officers and men serving in the Command during the year was 676. The garrison throughout the year consisted of the 24th Company, Western Division, Royal Artillery, and detachments of the Royal Engineers, Medical Staff Corps, Army Ordnance Corps, and Garrison Staff. The headquarters and four companies of the 2nd Battalion, York and Lancaster Regiment, arrived from South Africa in February: and the headquarters and four companies of the 1st Battalion, Royal Highlanders, left the Command for India in the same month.

In the subjoined table will be found the most important of the statistics of sickness and mortality among the troops:—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
676	799	6	—	6	34	6	55·90	1181·9	8·88	50·30	8·88	82·69

Compared with similar statistics in the previous year a decrease of 367·5 per 1,000 has occurred in the ratio of admission, one of 7·86 in that of mortality, and one of 2·18 in that of constantly sick; and, compared with similar average rates for the preceding ten years, there is a decrease in the admission rate of 212·5, and in the mortality rate of 7·49, but in the rate of constant inefficiency there is an increase of 9·93 per 1,000. The large decrease in the admission rate is mainly due to a decrease in the admissions for malarial fevers, 292 cases only being admitted as compared with 460 in 1895. The average sick time to each soldier was 30·26 days, which is shorter than in the previous year by ·72 of a day, but longer than the average period in the preceding ten years by 3·70 days. The average duration of each case of sickness was 25·60 days, longer than in 1895 by 5 61, and than the decennial average period by 6·56 days.

In Abstract XXV. will be found the principal statistics of sickness and mortality in arms of the service and individual corps. The admission rate in the Royal Artillery, 1805·5 per 1,000, shows a decrease as compared with the previous year, but the constantly sick rate, 131·04, has increased. In the Infantry the admission and constantly sick rates, 1035·6 and 73·12 per 1,000 respectively, are both lower than in 1895, the admission rate showing as much as 500·9 per 1,000 of decrease, and it will be observed that both rates are much lower than the corresponding rates in the Royal Artillery. Of the deaths 4, or 8·38 per 1,000, occurred in the Infantry, and 2, or 13·88 per 1,000, in the Royal Artillery.

With regard to the influence of age on sickness and mortality, it is calculated that among men under 20 years of age, average strength 23, the sick rate was 695·6 per 1,000, but there was no death; among men between 20 and 25 years of age the admission and mortality rates were 1468·8 and 10·83 per 1,000 respectively, both lower than the similar rates in the previous

Mauritius.

year; among men between 25 and 30 years of age the admission rate was 847·1, and the death rate 4·37 per 1,000, comparing favourably with the previous year's ratios; and among men over 30 years of age, with a small average strength, the admission rate was 855·5 and the death rate 18·18 per 1,000. With regard to service in the Command the admission ratio for men in their first year was 1108·8 per 1,000, a decrease of 689·1 on the corresponding rate in the previous year: among men in their second year of service the ratio was 1469·2 per 1,000, as compared with 1422·9 in the preceding year: among men in their third year, average strength 55, the ratio was 1181·8 per 1,000, and for men with over three years' service in the Command the average strength was only 4 with 3 admissions, or 750·0 per 1,000. Of the 6 deaths in the Command, 4, or a ratio of 8·21 per 1,000, occurred among men in their first year of service, and 2, or 15·38 per 1,000, among men in their second year of service.

The more important statistics of sickness and mortality, according to the different groups and orders of diseases will be found tabulated in Abstract No. X.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—There were no cases of *eruptive fevers* admitted during the year. *Enteric fever* caused 10 admissions and 3 deaths, being in the ratios of 14·8 and 4·44 per 1,000 respectively. Compared with corresponding ratios in the previous year, the admission rate has decreased by 8·0, and the mortality rate by 4·69, and compared with similar average ratios for the preceding ten years the former is higher by ·9, and the latter lower by ·57. The per-centage of mortality to attacks was 30·0 as compared with 40·0 in 1895. The Senior Medical Officer remarks that "the disease was prevalent amongst the civil population through-" out the year, and although every effort was made to trace the origin of the " individual cases amongst the troops, no definite cause could be discovered. " Little doubt, however, exists that the majority of the cases were contracted " in the dirty hovels which are frequented by the soldiers." Port Louis furnished 4 cases, Curepipe 5 cases, and 1 case is believed to have been contracted in South Africa, as the patient was admitted into hospital a few days after his arrival in the Island from that Command.

Dysentery was the cause of 13 admissions, being in the ratio of 19·2 per 1,000, which is below the corresponding rate in the preceding year by ·6, and the average rate by 2·9. One death occurred.

Malarial Fevers.—292 admissions are returned, equal to a ratio of 432·0 per 1,000, which is lower than the corresponding rate in the previous year by 268·1, and than the average rate for the preceding ten years by 182·2. The average number constantly sick from these fevers was equal to 26·32 per 1,000, which is 3·60 less than the corresponding rate in 1895, but slightly in excess of the decennial average rate. The cases comprised 274 of ague, 14 of remittent fever (1 fatal), and 4 of malarial cachexia.

Venereal Diseases.—26 admissions are shown under the head of *primary syphilis*, being in the ratio of 38·5 per 1,000, which is higher than in the preceding year by 2·0, but below the average rate. Adding the sickness for simple venereal ulcer, which caused 24 admissions and 2·14 constantly sick, the ratio of admission for primary venereal sores amounted to 73·9 per 1,000, which is below the average rate by 10·9, but above the rate in the previous year by 16·1. *Secondary syphilis* caused 33 admissions, or 48·8 per 1,000, as compared with 41·1 in the previous year, and with 31·0 the average rate. *Gonorrhœa* was the cause of 90 admissions, being equal to a ratio of 133·1 per 1,000, which shows an increase of 37·2 on the previous year's rate, and of 30·0 on the decennial average rate Including all forms of venereal diseases the total ratio of admission was 255·8 per 1,000, being greater than the corresponding rate in the previous year by 61·0, and than the average rate by 36·9. The total amount of constant inefficiency on account of these diseases was equal to 24·70 per 1,000, an increase of 7·43 on the ratio for 1895, and of 8·92 on the average rate.

Parasitic Diseases were represented by 2 admissions for tænia solium. Under the head of *alcoholism* 3 admissions are returned, as was the case in the previous year. No case of delirium tremens is recorded.

Mauritius.

Debility.—Under this heading 9 admissions are shown, the ratio, 13·3 per 1,000, being much below that for the preceding year, when there were 22 admissions.

Rheumatism caused 9 admissions, equal to a ratio of 13·3 per 1,000, a decline of 5·0 on the previous year's rate, and of 7·9 on the average rate. One case of rheumatic fever is returned.

Other diseases of this group caused 7 admissions, 6 being cases of papilloma, and one a case of anæmia.

LOCAL DISEASES.—*Diseases of the Nervous System.*—3 admissions are returned, being in the ratio of 4·4 per 1,000, a decline of 12·3 on the previous year's rate, and of 8·7 on the average rate. The cases were 2 of neuralgia, and 1 of vertigo.

Diseases of the Eye were the cause of 3 admissions, and there were 4 admissions for *diseases of the ear.*

Diseases of the Circulatory System.—5 admissions are returned, being at the rate of 7·4 per 1,000, a decrease of 3·3 on the corresponding rate in the preceding year, and of 8·0 on the decennial average rate. The admissions were 2 for valvular disease of the heart, and one each for palpitation, aneurysm of abdominal aorta (fatal), and varicose veins.

Diseases of the Respiratory System were the cause of 9 admissions, or 13·3 per 1,000, which is lower than the rate in the previous year by 27·8, and below the average rate of the preceding ten years by 10·8. Bronchitis was the cause of 8 of the admissions, and there was one case of asthma.

Diseases of the Digestive System caused 76 admissions; the ratio, 112·4 per 1,000, is slightly in excess of that in the preceding year, but is below the average rate by 3·4. The principal causes of admission were affections of the mouth and throat 25 cases, diarrhœa 17, colic 12, and dyspepsia 10.

Diseases of the Lymphatic and Glandular System, with 27 admissions, gave a ratio of 39·9 per 1,000, which is 5·2 below the average rate, but 29·2 above that in 1895.

Diseases of the Generative System gave a ratio of 41·4 per 1,000, or 12·5 above the rate in the preceding year, but below the average rate by 16·0.

Diseases of the Organs of Locomotion were represented by 11 admissions, equal to a ratio of 16·3 per 1,000, which is 2·0 lower than the previous year's rate, but 7·8 above the average rate. 8 of the admissions were due to synovitis.

Diseases of the Connective Tissue gave an admission rate of 17·8 per 1,000, being below both the previous year's and the average rates by 5·0 and 2·8 respectively.

Diseases of the Skin.—36 admissions are returned, itch, ulcers and boils being the principal causes. The admission rate, 53·3 per 1,000, is below the rates for the preceding year and the decennial period by 54·8 and 7·4 respectively.

Injuries.—85 admissions are recorded, the ratio being 125·7 per 1,000, which is slightly lower than the ratio in the preceding year, but higher than the decennial average rate. Among the admissions were 30 for wounds, 21 for sprains, and 18 for abrasions.

Invaliding.—The number of men invalided home during the year was 34, being in the ratio of 50·30 per 1,000, which is lower than the corresponding rates in the preceding year and decennial period by 7·54 and 5·0 respectively. Of the men invalided, 21, or 145·83 per 1,000, belonged to the Royal Artillery; 9, or 18·86 per 1,000, to the Infantry; 3, or 83·33 per 1,000, to the Royal Engineers; and 1, or 52·63 per 1,000, to Departmental Corps. With regard to age, 27 men, or a ratio of 73·17 per 1,000, were between 20 and 25 years of age; 5 men, or 21·84 per 1,000, were between 25 and 30 years of age; and 2 men, or 36·36 per 1,000, were over 30 years of age. As regards service in the Command, 14 men, or 28·75 per 1,000, were in their first year; 17 men, or 130·77 per 1,000, were in their second year; and 3 men, or 54·54 per 1,000, were in their third year. The causes of invaliding were malarial fevers, 22 cases, debility 3, rheumatism 3, secondary syphilis 2, diseases of the circulatory system 2, and dysentery and local injuries, one case each. The number of men finally discharged by invaliding was 6, equal to 8·88 per 1,000, a decline of 10·90 on the previous year's rate, and of 9·42 on the decennial average rate.

Mauritius. The causes of final discharge by invaliding were diseases of the circulatory system, 4 cases, and rheumatism and mental affections, 1 case each.

Officers.—The average strength was 34, and there were 22 admissions, equal to a ratio of 647·0 per 1,000, an increase of 178·3 on the corresponding rate in the preceding year. The principal causes of sickness were malarial fevers. Three officers were invalided, one each on account of malarial cachexia, laryngitis, and hepatitis. There were no deaths.

Women.—The average strength was 48 and the number of admissions was 34. The admission ratio, 708·3 per 1,000, shows an increase of 359·5 on the rate in the previous year. Debility caused 22 of the cases of sickness. No death occurred.

Children.—The average strength was 67, the number of admissions 43, and there were 5 deaths. The sick rate, 641·8 per 1,000, has increased by 383·7 as compared with the previous year's rate. Malarial fevers, diarrhœa, and dysentery were the chief causes of sickness, and there was one case of enteric fever, the origin of which could not be traced. The deaths were: 2 from debility, and one each from dysentery, remittent fever, and diarrhœa.

Vaccination and Small-Pox.—No cases of small-pox occurred amongst the troops in the Command during the year.

All the vaccinations were from preserved lymph, and out of 22 operations for re-vaccination among soldiers 6 were failures. Among children there were 10 primary vaccinations, of which 2 failed.

Sanitary Conditions.—The Senior Medical Officer (Brigade-Surgeon-Lieutenant-Colonel J. Fraser, M.D.) reports that at Port Louis "the general " sanitary condition of the town as well as, in a minor degree, the want of " drainage in the barracks act most prejudicially on the health of the troops " quartered there." The water supply at Port Louis is bad, the whole catchment area being thickly inhabited, and there is no system of sewerage or subsoil drainage, the night soil being removed by hand labour. Line Barracks is in the centre of this insanitary area, but is only occupied by Asiatic and non-European troops. A Pasteur-Chamberland filter of 50 candles was taken into use in September in these barracks and the floor of the cookhouse cemented. The latrine arrangements for the Asiatic troops are considered very insanitary, and other minor points, requiring remedy, are noted. At Fort George a system of drainage to the sea has been constructed, and a Pasteur-Chamberland filter of 25 candles was in course of erection. The outer and inner moats were filled in with coral; an embankment, obstructing the circulation, removed; the casemate roofs repaired, and the floors concreted. A swamp on the south-east was being filled in. The married quarters are considered unsatisfactory, and other minor requirements are noted. At Fort Adelaide the drainage is carried to catchpits outside, which are emptied by hand-labour. The south drain has been re-modelled, a new prisoners' room, and a new latrine for officers and non-commissioned officers constructed; and a 15-candle Pasteur-Chamberland filter brought into use. The ventilation of the officers' quarters is noted as requiring improvement.

At Curepipe the water supply is considered fairly good, that of the old barracks (huts) being from Mare-aux-Vacoas, a lake in the centre of the island about four miles from the camp, and that of the new barracks and married quarters rain-water. The water is said to be boiled before use. There is a dry-earth system of conservancy. Two additional drying-rooms have been provided in the old barracks, and, it is noted, drying-rooms are also much needed in the new barracks. New baths were also constructed for huts, previously without baths. The married quarters are without a bath-room, washhouse, or drying-room, and the latrine accommodation is reported to be insufficient.

It is observed that all the sick of the European troops in Port Louis are conveyed daily to the Station hospital at Curepipe, the sick of the non-European troops only being treated in the station hospital at Port Louis, and that the number of beds in the former is insufficient for the present strength.

A disinfecting chamber is recommended and other minor sanitary requirements are noted.

II.—NON-EUROPEAN TROOPS.

Mauritius.

The Asiatic troops consisted of the Mauritius Companies, Royal Artillery, average strength 134, and the Mauritius Company, Royal Engineers, average strength 34; the former being composed of men enlisted in India, and the latter raised locally from men of mixed races. The total strength was, therefore, 168, and there were 286 cases of sickness and 2 deaths, the ratio of admission equalling 1702·4 per 1,000, and that of death 11·90. The prevailing diseases were malarial fevers, which were the cause of 132 admissions, giving a ratio of 786·0 per 1,000, as compared with 936·3 in 1895, 1230·4 in 1894, and 1690·6 in 1893. The medical officer in charge reports that "it is not "known what has led to such a considerable fall." There were 10 admissions for dysentery, 13 for venereal affections, including 2 for simple venereal ulcer, 18 for bronchitis, 18 for digestive disorders (including 8 cases of diarrhœa), 30 cases of skin diseases, half of which are returned as boils, and 23 cases of local injuries. One man was invalided for induration of glands during the year, and there were two deaths, which occurred in men on furlough in India, the cause of death being unknown.

X.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF CEYLON.

Sickness and Mortality.

1.—European Troops.

Ceylon. The average strength of warrant officers, non-commissioned officers, and men was 1,336. The force comprised Nos. 6 and 37 Companies, Southern Division, Royal Artillery, half the 41st (Fortress) Company, Royal Engineers, the 2nd Battalion Royal Warwickshire Regiment, relieved in February on embarkation for England by the 1st Battalion Loyal North Lancashire Regiment from India, and detachments of the Army Service, Medical Staff, Army Ordnance and Army Pay Corps and Garrison Staff. The distribution of the troops in the three stations of the Command was as follows:—At Colombo, No. 6 Company, Southern Division, Royal Artillery, until November (when it was relieved by No. 37 Company), the headquarters of the Infantry battalions and a small detachment of the Royal Engineers; at Trincomali, No. 37 Company, Royal Artillery (until relieved by No. 6 Company), the major portion of the Royal Engineers, and a detachment of infantry; at Kandy, a detachment of infantry. The men of other corps were distributed in proportion throughout the three stations.

In the following table are given the more important of the statistics of sickness and mortality among the troops:—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids Sent Home.	Invalids finally Discharged.	Constantly Sick.
1,336	1,765	11	—	11	31	10	86·72	1321·1	8·23	23·20	7·48	64·91

On comparing the above with a similar table given in the Report for 1895, it is observed that the admission, mortality, and constantly sick ratios have increased by 314·4, ·08, and 3·45 per 1,000 respectively. In comparison with the corresponding ratios for the decennial period 1886–95, the admission rate is higher by 317·0, and the constantly sick rate by 7·09, while the death rate is lower by 3·15. The average sick time to each soldier amounted to 23·76 days, which is longer than in the previous year by 1·33 days, and than the average period for the preceding ten years by 2·06. The average duration of each case of sickness, 17·98 days, was shorter in both comparisons by 4· 30 and 3·04 days respectively.

The more important statistics relating to the various corps which served in the command are given in Abstract XXV., from which it will be seen that the admission rate for the Royal Artillery was 735·2, for the Royal Engineers 564·7, for the Infantry 1580·2, and for the Garrison Staff and Departments 368·4 per 1,000. Of the 11 deaths, 4 occurred in the artillery, and the remaining 7 in the infantry, the respective ratios being 15·81 and 7·29 per 1,000. The constantly sick ratio was 40·04 per 1,000 in the Artillery, 20·24 in the Engineers, 77·57 in the Infantry, and 10·53 among men of other corps.

The admission rate according to age was 714·3 per 1,000 of men under 20 years, 1608·5 per 1,000 among men between 20 and 25 1185·8 per 1,000 among men between 25 and 30, and 486·1 per 1,000 among men of 30 years of age and upwards. In 1895 the admission rate was highest among men between 20 and 25, and lowest among men under 20 years of age. The deaths occurred as follows: 1 death, equal to a ratio of 28·57 per 1,000, among men under 20 years, 4 deaths, or 5·67 per 1,000, among those between 20 and 25, 4 deaths, or 8·85, among men between 25 and 30, and 2 deaths, or 13·89 per 1,000, in men of 30 years of age and upwards. The highest ratio of mortality in the previous year was amongst men between 25 and 30 years, and the lowest, as in the year under report, in the age group 20 to 25. As to service in the Command the admission rates were 1275·7 per 1,000 among men in their first year, 1048·2 among those in their second year, 1968·7 among those in their third year, and 1944·9 among men who had been three years or longer in the Command. In the preceding year the admission ratio for men in their first year was about half that now recorded, the highest admission rate being for men in their second year. Of the deaths, nine out of the eleven were among men in their first year, the remaining two being among those in their second year and among those with more than three years' service in the Command. The respective ratios are 9·85, 4·02, and 9·17 per 1,000. In 1895 the highest death rate was among men in their second year, and the lowest among those who had more than three years' residence. *Ceylon.*

In Abstract XI. will be found the more important statistics of sickness and mortality arranged according to the various groups and orders of diseases.

General Diseases.—*Diseases dependent on Morbid Poisons.*—Under the heading of *eruptive fevers* 11 cases of chicken-pox are recorded, and it is stated that the disease was very prevalent among the civil population of Colombo during the early part of the year. *Enteric fever* caused 6 admissions and 1 death, the admission ratio, 4·5 per 1,000, being above the corresponding ratio for 1895 by ·8, but below the decennial average by 3·6 per 1,000. Five of the cases occurred at Colombo. The remaining case was also reported to have been contracted at Colombo although admitted into hospital at Kandy. This case was fatal. In no instance could the disease be accounted for by any defect in the sanitary condition of the barracks. Two of the men had recently arrived from Poona, where the disease was said to be prevalent, and the remainder are supposed to have contracted the disease in the adjacent native bazaars.

Simple Continued Fever, with 16 admissions, gave a ratio of 12·0 per 1,000, as compared with 71·9 in 1895, and 65·5 for the ten years 1886–95. All but two of the cases occurred at Colombo.

Dysentery caused 24 admissions and 1 death. The admission rate was 18·0 per 1,000. The corresponding ratios for 1895 and for the decennial period were 24·4 and 20·5 respectively. Twenty of the admissions were at Colombo, 18 being amongst men in their first year of service in the Command.

For *malarial fevers* there were 386 admissions, equal to a ratio of 288·9 per 1,000, which is higher than that for 1895 by 219·3, and than the average rate for the preceding ten years by 248·5. There were 3 deaths, all from remittent fever, hyperpyrexia being noted as the immediate cause of death in two of the cases. The exceptional increase in the sickness from these fevers is entirely due to the number of admissions for ague, 382 in all, of which 358 occurred amongst men of the 1st Battalion, Loyal North Lancashire Regiment, who are reported to have arrived from India, more or less saturated with malarial poisoning. The battalion, as already stated, arrived in February, and the admissions in the subsequent months for ague were as follows: March, 68; April, 80; May, 75; June, 27; July, 29; August, 11; September, 19; October, 22; November, 15; December, 12. It is also further shown that the admissions were excessive at Colombo, Kandy, and Trincomali, wherever detachments of the battalion were stationed.

Venereal Diseases.—*Primary syphilis* was the cause of 183 admissions, the equivalent ratio, 137·0 per 1,000, being above that for the previous year by 48·1. Including 24 admissions for simple venereal ulcer (for which there were 2·51 men constantly sick), the total admission ratio for primary venereal sores was 155·0 per 1,000, which is also higher than the previous year's rate by 21·2, and than the decennial average by 8·6 per 1,000. *Secondary syphilis* with 63 admissions, gave a ratio of 47·2 per 1,000, or 1·3 higher than in 1895, but 7·3 lower than the decennial ratio.

Ceylon.

Gonorrhœa caused 199 admissions, the ratio, 148·9 per 1,000, being in excess of that for the previous year by 34·1, and of the decennial average ratio by 16·9. The total admission rate for all forms of venereal disease amounted to 351·1 per 1,000, as compared with 294·5 in 1895, and 332·9 for the decennial period. The constant inefficiency from these diseases was at the rate of 24·77 per 1,000, which is lower than that for the previous year by ·81, but above the decennial average by 1·71.

Parasitic Diseases were represented by 3 admissions, viz., ascaris lumbricoides 2, tænia solium 1. There was 1 case of *scurvy* and 7 of *alcoholism*, all at Trincomali, where the medical officer in charge reports intemperance to have been very prevalent during the year, in consequence of the men getting enervated from want of occupation and evening amusements. No case of delirium tremens is recorded.

Debility.—There were 30 admissions, the ratio, 22·5 per 1,000, being below that for 1895 by 6·4, but above the average rate by 5·8.

Rheumatism caused 27 admissions, including one for rheumatic fever, which proved fatal. The ratio was 20·2 per 1,000, a decrease of 8·0 and 10·9 respectively, as compared with 1895 and the average rate for the decennial period. The fatal case occurred at Trincomali in a man recently arrived from England, who was a very heavy drinker and was already in hospital suffering from boils.

For *tubercular disease* of the lung there were 3 admissions. The remaining admissions in the same group were 6 each for non-malignant new growth and anæmia.

LOCAL DISEASES.—*Diseases of the Nervous System* caused 8 admissions, including 1 for mental disorder, the ratio, 5·9 per 1,000, being in excess of that for 1895 by 2·2, but below the decennial average by 4·5. Neuralgia furnished 5 of the cases, and wry-neck, hysteria and melancholia one each. No death occurred.

Diseases of the Eye.—There were 17 admissions, or a ratio of 12·7 per 1,000, which is lower than that for the preceding year by 1·4, and fractionally below the average. Conjunctivitis furnished 16 of the admissions, the remaining admission being for myopia. For *diseases of other organs of special sense* 29 admissions are recorded, all for inflammation of the external meatus, the equivalent ratio being 21·7 per 1,000, as compared with 14·8 in 1895 and 6·1 for the decennial period.

Diseases of the Circulatory System contributed 9 cases, equal to 6·7 per 1,000, which is higher than the previous year's rate by 1·5, but below the decennial average by 1·7. Of the cases, 4 were returned under palpitation, 2 under angina pectoris, and 1 each under valvular disease of the heart and varicose veins. The ninth and only fatal case was an admission for fatty degeneration of the heart. This death also occurred at Trincomali, and the original cause of the admission to hospital is stated to have been intemperance.

Diseases of the Respiratory System were the cause of 17 admissions, or a ratio of 12·7 per 1,000, an increase of ·8 on the previous year's rate, but less than the decennial average rate by 12·2. Bronchial affections caused 12 of the admissions, pneumonia 2, and laryngitis, pneumonic phthisis, and pleurisy 1 each. There was no death under this head.

Diseases of the Digestive System.—122 admissions are returned. The admission ratio, 91·3 per 1,000, is lower than the ratios for the previous year and the decennial average by 16·9 and 11·9 respectively. Among the cases treated were 31 of hepatic affections, including 4 of abscess of the liver, 32 of affections of the mouth and throat, 23 of dyspepsia, 17 of diarrhœa, and 6 of colic. No death occurred. Two of the cases of abscess of liver made perfect recoveries after operation.

Diseases of the Lymphatic and Glandular System caused 77 admissions, mostly for inflammation of the lymphatic glands, equal to a ratio of 57·6 per 1,000, as compared with 57·1 in the previous year and 62·0, the decennial average rate. The ratio of constant inefficiency from this cause was 5·38 per 1,000, as against 7·70 and 6·66 respectively in the two comparisons, and the Senior Medical Officer considers that the reduction in constant inefficiency from this cause is due to the number of cases treated by the operation for removing the diseased glands. He also states that inflammation of the glands is hardly known in Trincomali, whereas it is prevalent in Colombo, and influenced by the moist heat there. There were 6 admissions, for example, under this heading at the former station with a garrison of 404, as compared with 58 in the latter with a garrison of 790, and 13 at Kandy with a garrison of 142.

Under the heading of *diseases of the urinary system* are recorded 2 cases of incontinence of urine.

Diseases of the Generative System gave 57 admissions, of which 24 were for simple venereal ulcer and 15 for orchitis. The ratio per 1,000 was 42·7, which is below the previous year's rate by 18·1 and the decennial average by as much as 51·9.

Diseases of the Organs of Locomotion, with 24 admissions, all of which were due to synovitis, furnished a ratio of 18·0 per 1,000, or 8·4 and 11·3 higher than in 1895 and the decennial period respectively.

Diseases of the Connective Tissue contributed 63 admissions, the ratio, 47·2 per 1,000, being above the previous year's rate by 2·8 and the decennial average by 20·3. Of the cases, 16 were due to inflammation and 47 to abscess of the connective tissue.

Diseases of the Skin caused 214 admissions, mostly ulcers, boils, ring-worm and eczema. The ratio was 160·2 per 1,000, which is in excess of the previous year's rate and of the decennial average by 87·6 and 90·1 respectively.

Injuries.—145 cases are returned. The equivalent ratio was 108·5 per 1,000, as compared with 94·8 in 1895 and 96·0 for the decennial period. Under the heading of general injuries a fatal case of heat apoplexy is recorded at Trincomali and two cases of accidental drowning at Colombo. Among local injuries the most frequent causes of admission were wounds, contusions, sprains, and abrasions. A number of these at Trincomali are attributed to intemperance. There was one death from fracture of spine with compression of cord, caused by a fall from a barrack-room verandah at Colombo.

Invaliding.—The number of men invalided to England was 31, the equivalent ratio being 23·20 per 1,000, which is higher than the previous year's rate by 6·90, and than the average ratio by 3·60. Of the men invalided, 4, or 15·81 per 1,000, belonged to the Royal Artillery, 26, or 27·08 per 1,000, to the Infantry, and 1 man, or 26·32 per 1,000, to the Garrison Staff and Departments. None of the invalids were under 20 years of age; 18, or 2·55 per 1,000, were between 20 and 25, as compared with 16·28 in 1895; 10, or 22·12, were between 25 and 30, as against 21·34 in 1895; and 3, or 20·83 per 1,000, were upwards of 30 years of age, the corresponding ratio in the previous year being 8·85. With regard to service in the Command, 25 men, or 27·35 per 1,000, were in their first year, 2 men, or 8·03 per 1,000, in their second year, 1 man, or 15·62 per 1,000, was in his third year, and 3 men, or 27·52 per 1,000, had more than 3 years of service in the Command. In 1895 the corresponding ratios were 5·65, 19·35, 13·89, and 27·61 respectively. The principal causes of invaliding were: malarial fevers, 6 cases; secondary syphilis, 5; debility and hepatitis, each 3 cases, and tubercle of lung, anæmia, and congestion of the liver, each 2 cases. There were 10 men discharged the service as medically unfit, the ratio being 7·48 per 1,000, as compared with 10·37 in 1895, and 11·70 for the decennial period. Two men were discharged on account of secondary syphilis, two for tubercle of lung, and one each for rheumatism, anæmia, dementia, pneumonic phthisis, curvature of spine, and rupture of muscle.

Officers.—In an average strength of 52 there were 41 cases of sickness. The rate of admission was 788·5 per 1,000, which is in excess of that recorded for 1895 by 200·3. Among the principal cases treated were 6 of malarial fever, 5 of injuries, 4 of dysentery, and 3 of simple continued fever. One officer died from abscess of liver and one was invalided on account of tubercle of lung, but neither belonged to the corps serving in the Command, the former being on sick leave from Burma while the latter was disembarked from the hired transport conveying the 1st West Yorkshire Regiment to Hong Kong.

Women.—The average strength was 67 and the number of admissions 60. The chief causes of admission were malarial fever and debility, of each of which there were 20 cases. The ratio of admission was 895·5 per 1,000, as compared with 1215·4 in 1895. There was no death.

Ceylon.

Children.—There were 69 cases of sickness and 7 deaths in an average strength of ·102 children, the ratios of admission and mortality being 676·5 and 68·63 per 1,000 respectively, the former lower than the corresponding ratio for the previous year by 487·0 and the latter higher by 49·40. Debility furnished 11 cases, malarial fever 10, simple continued fever 7, bronchitis 5, teething 4, and the remainder was distributed amongst various diseases. The deaths were 2 from debility and 1 each from influenza, remittent fever, anæmia, bronchitis, and pneumonia.

Vaccination and Small-pox.—There were no cases of small-pox during the year, and the state of vaccination is reported to have been satisfactory. There were no vaccination operations amongst recruits or women. There were 27 primary vaccinations with 11 failures, amongst children; no primary vaccinations amongst men, 5 re-vaccinations with no failures amongst children, and 40, with 9 failures, amongst men. All the operations were with preserved lymph.

Sanitary Conditions.—The stations to which the Medical Officers' reports refer are Colombo, Kandy, and Trincomali. At Colombo the sanitary conditions appear generally satisfactory. The water supply is reported to be good and ample, conveyed to the town in pipes from a large lake 23 miles distant, and distributed to the barracks by taps. Chattie filters are used, but a supply of Pasteur-Chamberland filters are expected in 1897 to replace them. The lake near the échelon barracks, hospital, and married quarters has been cleaned out and all bathing and washing in it stopped. The dry earth system of conservancy is in operation and is reported to work satisfactorily. The beef ration is noted as coarse and tasteless, and much satisfaction is anticipated when the Australian fed beef and mutton come to be issued in 1897. The other rations are satisfactory.

The chief diseases prevalent among the civil population at Colombo were malaria, dysentery, and hepatic affections. An epidemic of cholera, supposed to have been introduced from India, broke out in a locality about ½ mile from barracks towards the end of November, but did not affect the troops.

In the first three months of the year the "longshore wind," a division of the N.E. monsoon, is said to cause sore throats, ear ache, and bowel complaints.

At Kandy, the general sanitary condition of the barracks is reported to be satisfactory. The water supply to the troops is conveyed in iron pipes from a reservoir situated about ½ mile from the town. It is subjected to filtration through chatties, which are considered useless by the medical officer in charge of the troops. The lavatories and means of ablution, including a good plunge bath, are ample. The dry earth system of conservancy is employed, but the medical officer reports that night soil is not disposed of by burning or burying, but is left deposited in a heap about three miles distant, and that the native latrines are kept in an insanitary condition. With regard to rations, the quality is said to be good, but the station does not afford facilities for much variation. The aërated water manufactories, which supply the troops, were not sanitary, and aërated waters of very good quality were eventually procured from Colombo. Several families, who came to Kandy for change of air from Colombo and Trincomali, all benefited by the change, and the health of the troops generally was good. Amongst the native population, on the other hand, malarial fevers, enteric fever, dysentery, diarrhœa, chicken-pox, phthisis, and venereal diseases are reported to have been prevalent, and the insanitary condition of the town is strongly commented upon, the latrine accommodation being reported to be wholly inadequate and in a filthy state, cesspits and surface drains out of repair, and bakeries, &c., guided by no sanitary law. These matters were brought to the notice of the Municipal Council.

The Medical Officer in charge of the troops at Trincomali brings to notice many conditions bearing upon the health of the troops there. There was a great scarcity of vegetables. All potatoes are imported and the supply sometimes failed. Attempts to grow vegetables in regimental gardens failed on account of poorness of soil, amount of labour required to keep it in order, and the difficulty of getting water except in the rains. The quality of the beef is so unfavourably reported upon on account of the difficulty of obtaining fodder in the dry months of the year. Fish is, however, very plentiful, and is

Ceylon.

used largely by the men as a supplement to their ration. The water supply is from wells covered over and supplied with pumps. In Fort Frederick they are in the low ground and the water is carried up to the quarters on the higher ground by coolie labour; at Fort Ostenburg it is pumped up and distributed in pipes. In both cases the supply is reported to be inadequate; at Fort Frederick on account of insufficient labour for carrying the water to the hill, and at Fort Ostenburg, because of the intermittency of the supply. During the rains the supply at Fort Frederick is supplemented by rain water collected on the roofs and stored in tanks. The wells are said never to run dry and the water is of good quality. No water-borne diseases occurred amongst the troops. Chattie filters are employed, but are considered unnecessary and objectionable by the Medical Officer in charge. The dry earth system of conservancy is used. A new system of drainage for the removal of surface and foul water in separate pipes to the sea was completed at Fort Frederick during the year. The two blocks used by the detachment of infantry in Fort Frederick were closed in September on account of their unhealthiness, and the men accommodated in Fort Ostenburg. The lower part of Fort Frederick, where the blocks are situated, is reported to be much overcrowded by buildings and the Medical Officer in charge considers that the infantry blocks should be condemned. The following new buildings have been erected: A long block of four married quarters on the hill of Fort Frederick; a washhouse for the garrison cells; a cookhouse for the sergeants' quarters in the hospital grounds, and new latrines for the Royal Artillery, guardroom and signal station. A large amount of intemperance is reported to have existed amongst the troops at Trincomali, notwithstanding every effort made to stop it. The Medical Officer thinks that an improvement might be effected by the provision of a gymnasium and small theatre, as, in his opinion, the men get enervated from want of occupation and recreation, and take to drink in consequence. A note is made in this Medical Officer's report on the discomfort of the thick flannel shirts, and on the manner in which they aggravate "prickly heat," whichi very prevalent there. He recommends a thinner and finer shirt for wear in the tropics.

II.—ASIATIC TROOPS.

The Asiatic troops comprised the two Ceylon companies, Royal Artillery, average strength 173, and the Ceylon Company, Submarine Miners, Royal Engineers, average strength 41, the total strength, therefore, being 214.

A portion of the Artillery were stationed at Colombo, and the remainder, with the Engineers, at Trincomali.

There were 196 cases of sickness, equal to a ratio of 915·9, a decrease of 285·9 as compared with that for the preceding year, and 4·40 men were constantly sick, the ratio, 20·56 per 1,000, being lower than in 1895 by 7·91. Two deaths occurred, one each from debility, and rupture with laceration of spleen, the latter being caused by a blow from a stick during a native quarrel, and two men were invalided on account of debility.

The average sick time to each soldier, 7·53 days, was shorter by 2·89, and the average duration of each case, 8·19 days, by ·46 of a day than in the year before.

Cutaneous affections caused 49 admissions, among the remainder being 44 for ague, 11 for venereal affections, 10 for dysentery, and 29 for injuries.

China.

XI.—ON THE HEALTH OF THE TROOPS SERVING IN CHINA.

Sickness and Mortality.

I.—European Troops.

The average strength of the troops serving in the Command was 1,470. The force throughout the year consisted of two companies of Artillery, the 12th and 35th Companies, Southern Division, detachments Royal Engineers, Army Service Corps, Medical Staff Corps, Army Ordnance Corps, Army Pay Corps, and Garrison Staff. The 1st Battalion West Yorkshire Regiment arrived on 16th November, and the 1st Battalion Rifle Brigade left on 23rd of the same month.

The subjoined table gives the principal statistics of sickness and mortality among these troops:—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
1,470	2,729	11	—	11	90	46	128·73	1856·5	7·48	61·22	31·29	87·57

Compared with a similar table for the previous year, the ratio of admission has increased by 473·0 per 1,000, and the ratio of constantly sick by 14·18,* but the mortality rate has decreased by 5·72. In comparison with corresponding ratios for the preceding ten years, the increase in the admission and constantly sick rates amounted to 600·5 and 26·18 respectively, but the mortality rate shows a reduction of 3·96. The average sick time to each soldier was 32·05 days, which is longer by 5·27 days than in the previous year and by 9·64 than the average for the ten years. The average duration of each case of sickness was 17·26, which was shorter by 2·10 days than in the previous year, and ·58 of a day below the average for the decennial period.

The principal statistics of sickness and mortality according to arms of the service and by individual corps will be found in Abstract XXV. In the Artillery the highest rates of admission and constantly sick occurred in No. 12 Company, Southern Division, with 2036·8 and 96·03 per 1,000, but the rate of mortality was highest in No. 35 Company, with 14·93 per 1,000. The 1st Battalion West Yorkshire Regiment, which was in the Command for less than two months, furnished the highest admission and constantly sick rates, 2368·8 and 97·79 per 1,000 with no mortality, and the 1st Battalion Rifle Brigade, in which 6 deaths occurred, gave admission, death, and constantly sick rates of 1969·3, 6·82, and 94·40 per 1,000. The ratios of admission and constantly sick in the Royal Engineers and Departmental Corps were, as in previous years, comparatively low.

As to the influence of age on sickness and mortality, it is observed that the admission rate among men under 20 years of age was 1333·3 per 1,000, among men between 20 and 25 years of age 1946·2, among men between 25 and 30 years 2036·7, and among men of over 30 years of age 1077·3 per 1,000. With the exception of the admission rate among men under 20 years, which

---

* Some explanation of the marked increase in the admission and constantly sick rates will be found in the remarks under the heading of malarial fevers on the next page.

China.

in the preceding year was abnormal (8466·7), increase has taken place in the admissions for all the age groups. Of the deaths in the Command, 3, or 3·75 per 1,000, occurred among men between 20 and 25 years of age, 3, or 6·48 per 1,000, among men between 25 and 30 years, and 5, or 27·62, among men above 30 years of age. No mortality occurred in men under 20 years of age, either in the year under review or in the preceding year.

With regard to service in the Command, the admission rate for men in their first year was 3784·6 per 1,000, among men in their second year 1375·3, among men in their third year 568·2, and among men over three years' service in the Command 194·4. The same comparative sequence occurred as in the previous year. There were 4 deaths, or 10·63 per 1,000, among men in their first year of service, and 7, or 7·80 per 1,000, among men in their second year.

These rates correspond with those of the previous year, the highest death rate in that year occurring among men with less than one year's service in the Command, and no deaths among men in their second or third year of service. The falling off in the death rate is attributed to the fact that "the invalids who "were formerly sent home only once a year, are now sent in smaller groups "as opportunity by steamer offers," and "the greatest possible benefit has "resulted from this system."

The more important statistics of sickness, mortality, invaliding, &c., according to the different groups and orders of diseases are shown in Abstract XII.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—Under *eruptive fevers* there was no admission during the year. There were 11 admissions for and one death from *enteric fever*, equal to ratios of 7·5 and ·68 per 1,000, the former showing an increase of 4·2, but the latter a decrease of ·64 in comparison with the previous year's rates, while in comparison with the decennial average an increase of 6·2 in the admission rate, and of ·16 per 1,000 in the death rate has occurred. The per-centage of mortality to attacks was 9·1, against 40·0 in the preceding year, and 38·9, the decennial average. The cases were admitted from various barracks, and as no insanitary condition could be found it was suspected that the disease was in most cases contracted by drinking mineral waters supplied by the Chinese. *Other continued fevers* caused 183 admissions as compared with 11 in the foregoing year and 4 in 1894. The ratio per 1,000, 124·5, was higher than that of the previous year by 117·2 and than that of the average of the preceding ten years by 114·2. This great increase was considered to be due to the very trying summer of 1896. Another explanation will be found under the remarks on malarial fevers. Under *bubonic plague*, 3 admissions with 2 deaths are shown, and *sporadic cholera* caused one admission, which terminated fatally. There were 8 admissions for *dysentery*, giving a ratio of 5·4 per 1,000, showing a decrease on that of the previous year and ten years' average of 5·2 and 8·4 per 1,000 respectively. There was one admission for diphtheria, the origin of which could not be traced.

Malarial Fevers, with 871 admissions, equal to a ratio of 592·5 per 1,000, show an increase on last year's ratio of 117·9, and on that of the ten years' average of 132·9 per 1,000, but there was no death. Of the admissions, 838 were for ague, 12 for remittent fever, and 12 for malarial cachexia. In connexion with this increase in admissions for malarial fever, it is noted that during the year a rule was put in force, by which every man brought to hospital with a rise of temperature, was shown as an admission, the object being to secure a record of the attack in the medical history sheet. In this way many cases which in previous years were probably only detained for 24 hours on account of trivial attacks, were shown in 1896 as admissions. It is also noted that there was a remarkable decrease in the admissions for remittent fever, only 12 cases being so shown as compared with 136 in 1895. Some light is thrown upon this by the fact that in 1895 there were 11 cases of simple continued fever as compared with 183 in 1896, there being an apparent change in the diagnosis of the two diseases in the year under review, that is to say, admissions which in 1895 would have been shown as remittent fever were in 1896 shown as simple continued fever.

Septic Diseases caused one admission, a case of erysipelas.

China.

Venereal Diseases.—The admissions for *primary syphilis* were 96 in number, giving a ratio of 65·3 per 1,000, as compared with 44·2 in the previous year, and 37·1, the average rate for the preceding ten years. Adding to this the sickness for simple venereal ulcer, for which there were 210 admissions and an average of 18·36 constantly sick, the admission ratio for primary venereal sores was 208·1, being an increase on the previous year's rate of 60·9, and on the ten years' average rate of 67·3. *Secondary syphilis* caused 156 admissions, equal to a ratio of 106·1 per 1,000, which is above the preceding year's rate by 42·7, and the ten years' average by 57·1. *Gonorrhœa* was the cause of 277 admissions, or 188·4 per 1,000, which shows a decrease of 4·3 in comparison with the rate for the foregoing year, but an increase of 52·9 on the average rate. Including all forms of venereal disease the total admission rate was 502·6 per 1,000, being an increase on the rate for the previous year of 99·3, and on that of the average of 177·3. The total amount of constant inefficiency from these diseases equalled 38·50 per 1,000, or 6·54 above the rate for 1895, and 14·22 above the average rate.

Alcoholism caused 2 admissions as compared with 6 in the foregoing year.

Debility was the cause of 50 admissions, equal to a ratio of 34·0 per 1,000, being above the previous year's rate by 12·2 and the average rate by 13·1 per 1,000.

Rheumatism caused 55 admissions, including 3 of rheumatic fever, giving a ratio of 37·4 per 1,000, or 23·5 in excess of the previous year's rate and 19·4 per 1,000 in excess of the average rate.

Tubercular Diseases caused 3 admissions, (all tubercle of the lung), as compared with 11 in the preceding year. The ratio per 1,000, 2·0, is lower than in 1895 and the decennial period by 5·3 and 2·7 respectively.

Other general diseases were the cause of 28 admissions, including 25 cases of non-malignant growth, 1 case of malignant growth, which terminated fatally, and one admission each for purpura and anæmia.

LOCAL DISEASES.—*Diseases of the Nervous System* were the cause of 16 admissions, or a ratio of 10·9 per 1,000, being 8·3 above the previous year's rate and 4·6 above the average rate. Of the cases 2 are shown as mental disease, and the remaining admissions were 9 for neuralgia, 2 for vertigo, 1 each for paralysis and epilepsy, and 1 for abscess of the brain, the last-named terminating fatally.

Diseases of the Eye contributed 21 admissions, equal to a ratio of 14·3 per 1,000, which is in excess of the previous year's and ten years' average by 8·4 and 6·0 respectively.

Diseases of other Organs of Special Sense caused 46 admissions, giving a ratio of 31·3 per 1,000, which shows an increase of ·9 on the ratio for the preceding year, and of 17·8 on the average rate. The cases, with a single exception, were due to aural affections, the greater number being for inflammation of the external meatus.

Diseases of the Circulatory System were the cause of 30 admissions, the ratio per 1,000 being 20·4, or 15·8 and 7·6 above the previous year's rate and the decennial average respectively. The majority of the admissions was due to valvular disease of the heart and palpitation. Two deaths are recorded under the former affection.

Diseases of the Respiratory System gave 32 admissions, the ratio per 1,000 being 21·8, which is 2·7 above the previous year's rate, but, compared with the average rate for the preceding ten years, shows a decline of 5·8 per 1,000. There were 20 admissions for bronchial affections and 8 for pleurisy.

Diseases of the Digestive System were the cause of 194 admissions, equal to a ratio of 132·0 per 1,000, which, compared with the previous year's and average rates, shows an increase of 35·6 and 38·5 respectively. The principal causes of admission were affections of the mouth and throat 39 cases, diarrhœa 36, dyspepsia and colic 35 cases each, and hepatitic diseases 25 cases. Among the latter were 2 deaths, 1 from hepatitis and 1 from cirrhosis of liver.

Diseases of the Lymphatic and Glandular System, with 48 cases, caused an admission rate of 32·7 per 1,000, or 1·7 in excess of the ratio for 1895 and 7·6 per 1,000 above the decennial average rate.

Diseases of the Urinary System were represented by 7 admissions, equal to a ratio of 4·8 per 1,000, being above the preceding year's and the average rates by 4·1 and 1·2 respectively.

China.

Diseases of the Generative System gave 233 admissions, the ratio per 1,000 being 158·5, showing an increase on the previous year's an d decennial average rates of 33·1 and 34·9 respectively. Of the admissions 210 were for simple venereal ulcer.

Diseases of the Organs of Locomotion caused 17 admissions, the ratio being 11·6 per 1,000, which is only slightly above that of the previous year, but 2·3 above the decennial average. Twelve of the admissions were for synovitis.

Diseases of the Connective Tissue, with an admission ratio of 34·7 per 1,000, in comparison with the previous year's and decennial rates, shows an excess of 18·9 and 10·5 respectively. The admissions comprised 20 of inflammation and 31 of abscess of the connective tissue.

Diseases of the Skin show 141 admissions and a ratio per 1,000 of 95·9, or an increase of 33·5 per 1,000 on the previous year's rate, and of 44·8 on the average rate.

Injuries.—142 admissions with 1 death are returned. The admission ratio per 1,000, 96·6, is higher than the previous year's rate by 2·9 and than the average rate by 9·0. Wounds, sprains and contusions were the principal causes of admission. The three admissions for general injuries were all from effects of heat, one of them terminating fatally.

Invaliding.—The number of men invalided home was 90, equal to a ratio of 61·22 per 1,000, which is an increase of 7·76 on the rate for 1895 and of 32·54 on the average rate. The invaliding rate was highest in the Artillery, being 74·07 per 1,000, showing an increase of 5·58 on the preceding year's rate. Invaliding in the Infantry, with a rate of 62·87, came next, and shows an increase of 10·34 on the preceding year's rate. In the Engineers the ratio, 46·66, also exceeds the previous year's rate by 12·41 per 1,000. According to age it is observed that 54 of the men, or 67·58 per 1,000, were between 20 and 25 years of age, 25, or 54·00, were between 25 and 30 years, and 11, or 60·77 per 1,000, were over 30 years of age. In the previous year the highest rate occurred among men over 30 years, and the lowest among men between 20 and 25 years of age. There was no invaliding in either year amongst men under 20 years of age. With regard to service in the Command, 16 men, equal to a ratio of 42·55 per 1,000, had less than one year's service in the Command; 74, giving a ratio of 82·41 per 1,000, were in their second year of service, and there was no invaliding amongst men who had over two years' service in the Command. In the previous year the highest rate occurred, as in the year under report, amongst men in their second year of service. The principal causes of invaliding were malarial fevers, debility, circulatory disorders, and secondary syphilis. The number of men finally discharged by invaliding was 46, or a ratio of 31·29 per 1,000. The disabilities necessitating discharge were debility (11), circulatory disorders (8), tubercle of lung (5), diseases of organs of locomotion (4), diseases of the ear (4), malarial fevers (3), mental disorders (2), diseases of the eye (2), respiratory diseases (2), local injuries (2), rheumatism (1), diseases of the digestive system (1), and urinary diseases (1).

Officers.—The average strength was 62, and there were 47 attacks of illness and 1 death, the equivalent ratios being 758·1 and 16·13, the former 129·1 per 1,000 higher than, and the latter exactly similar to, the corresponding ratios in the previous year. The chief admissions were due to febrile diseases. Two were for enteric fever, the origin of which could not be definitely stated. The death was from malarial cachexia. Six officers were invalided, 2 for enteric fever, and one each for debility, dilatation of heart, diarrhœa, and hepatitis.

Women.—The average strength was 65, and the attacks of illness were 118 in number, with 1 death, the corresponding ratios per 1,000 being 1815·4 and 15·38. The admission rate is 730·9 and the death rate 15·38 per 1,000 above that of the previous year, there being no death in that year. The chief causes of admission were malarial and other fevers, and the death was due to eclampsia. The great increase in the admission rate is apparently due to the fact that all cases of illness amongst the women were shown as admissions, as well as to the unusually trying nature of the summer in 1896.

Children.—The average strength was 125, and there were 174 admissions to hospital with 5 deaths, the equivalent ratios being 1392·0 and 40·00 per 1,000, showing an increase respectively of 429·0 and 17·78 as compared with the previous year. The chief causes of admission were malarial and other fevers, bronchial affections, and debility. The 5 deaths were due to simple continued

China.

fever, remittent fever, infantile convulsions, bronchial catarrh, and eczema, one death each.

Small-pox and Vaccination.—There were no cases of small-pox. A single instance of primary vaccination from arm to arm in a child proved a failure; of 10 cases of primary vaccination from preserved lymph amongst children there were 7 failures, and of 61 cases of re-vaccination amongst men and 12 amongst children, from preserved lymph, 40 were failures.

Sanitary Conditions.—The Principal Medical Officer, Surgeon-Colonel G. J. H. Evatt, M.D., reports that the general health of the troops was very indifferent owing to the intense heat of the summer months, combined with excessive dampness. It is noted, however, that although more than 1,100 of the native population died of bubonic plague during the year, there was no epidemic amongst the troops. Amongst general sanitary observations it is stated that the want of a good military hospital is most urgent, and that it is highly desirable to house the European troops on the higher levels of the colony away from the exhausting heat of the damp Hong Kong summer and the over-crowded and unhealthy city of Victoria. A suggestion is also made that mutton be issued once a week to introduce variety into the diet, and that permanent barracks be constructed at Gun Club Hill, Kowloon, for European troops, in place of mat-sheds.

The Station Hospital for European troops is partly on the harbour ship "Meanee," and partly on shore in the Wellington Barracks. In the former the air, it is said, is not of the purest, and there are no urinals or latrines for the wards on the lower deck. The Wellington barracks portion of the hospital is reported to be badly situated, inappropriate for hospital purposes and inadequate as regards accommodation. There are no reading or prisoner's rooms, no recreation ground, and no infectious diseases ward; the waterclosets are not on the same floor as the wards, the kitchen is too small, the means of ablution insufficient and unsatisfactory, all essentials, in fact, of a modern hospital being wanting. The hospital for non-European troops, also in Wellington Barracks, is an ordinary barrack-room and considered equally unsuitable. A severe typhoon occurred in July and interrupted the communication with the "Meanee" for two days. It also destroyed the mat-sheds at Kowloon and at the Sanitarium. The latter, which was opened on the 4th June and closed on 5th November, has a non-dieted hospital. The mat-shed there was reconstructed and improved after the typhoon, and the parade ground levelled and drained.

At Kowloon, where there is a hospital for the non-European troops, the mat-sheds, containing 15 beds supplementary to the beds in the permanent hospital building, were not re-constructed after being destroyed by the typhoon, but a barrack-room was occupied for hospital purposes. Other sanitary conditions at Kowloon were considered satisfactory. Amongst improvements effected during the year it is noted that bath-rooms were constructed for the married families, and a watercloset and bath-room for servants at the officers' mess. The sanitation of G Block, Queen's Road Barracks, was generally improved.

With regard to the non-European troops, (*see below*), it is noted that they had a very sickly season, admissions for malarial fevers being more than doubled. The barracks of the Hong Kong Company, R.A., stated to be an old warehouse, are considered quite unfit for barrack-rooms. The system of rationing these companies by money allowance instead of by drawn ration, as in the Hong Kong Regiment, is considered bad. Amongst improvements effected in their barracks, it is noted that the guard and prisoners' room at Kowloon were improved, water laid on to the married and native officers' quarters, and a latrine for Chinese servants constructed.

II.—ASIATIC TROOPS.

The force consisted of the Hong Kong Companies, Royal Artillery, average strength 415, the Chinese Section, Submarine Miners, Royal Engineers, average strength 47, and the Hong Kong Regiment with an average strength of 852. The total average annual strength was 1,314, and the number of admissions into hospital 1,545. There were 12 deaths, including 4 men who died

China.

while on leave in India, 39 men were discharged as invalids during the year, and there were 59·59 men constantly sick. The ratio of admission equalled 1175·8 per 1,000, that of mortality 9·13, of invaliding 29·68, and of men constantly ineffective through sickness 45·35 per 1,000. Compared with the previous year, there is an increase in the rates of admission, invaliding, and constantly sick to the extent of 413·1, 16·76, and 13·15 per 1,000 respectively, the exceptional severity of the hot season being stated as the probable cause of this increase.

The increase of sickness has been mainly in the Hong Kong Companies, Royal Artillery, ague and rheumatism being very prevalent amongst them.

The death rate shows a decrease of ·75 in comparison with that of 1895.

Of the admissions, 518 were due to malarial fever, 511 being recorded as ague, 6 as malarial cachexia, and 1 as remittent fever. There were 17 cases of mumps, 7 of which in Hong Kong were confined to men of a draft arriving from India in April. The remaining 10 occurred in Kowloon, but it is not stated whether they belonged to the same draft or not. The other chief causes of admission were cutaneous diseases 224, respiratory diseases 103, including 55 cases of asthma; injuries 174, venereal diseases 153, and digestive disorders 93 cases. For bubonic plague there were 5 admissions (including an officer) and one death. The other deaths in the Command were one each from dysentery, septicæmia, tubercle of lung, enteritis, fracture of skull, remittent fever, and pneumonia. Of the four deaths in India 2 were due to cholera, and 1 to pneumonia. The cause of the fourth death was not ascertained.

XII.—ON THE HEALTH OF THE TROOPS SERVING IN THE STRAITS SETTLEMENTS.

Sickness and Mortality.

I.—European Troops.

Straits Settlements. The average strength of warrant officers, non-commissioned officers and men serving in the Straits Settlements was 1,352. The troops stationed in the Command throughout the year were the 25th and 38th Companies Southern Division, Royal Artillery, detachments of the Royal Engineers, Army Service Corps, Medical Staff Corps, Army Ordnance Corps, Army Pay Corps, and Garrison Staff. The 1st Battalion Rifle Brigade arrived from Hong Kong in November, and the 2nd Battalion Northumberland Fusiliers left for England in the same month.

In the following table the principal health statistics of these troops are given:—

1896. Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids Sent Home.	Invalids finally Discharged.	Constantly Sick.
1,352	1,453	10	2	12	20	3	97·74	1074·7	8·88	14·79	2·22	72·29

Compared with the return for the previous year the admission, death, and constantly sick ratios show an increase of ·9, ·84, and 1·40 respectively. Compared with the average rates for the preceding ten years there is a decrease of 4 7 in the admission rate, while the mortality and constantly sick rates are higher, the former by 1·61, and the latter by 2·20 per 1,000. The average sick time to each soldier was 26·46 days, which is longer than the corresponding period in the previous year by ·58, and than the average period for the preceding ten years by ·88 of a day. The average duration of each case of sickness was 24·62 days, which is longer than in 1895 by ·53, and than the decennial average rate by ·92 of a day.

The principal statistics of sickness and mortality of individual corps will be found in Abstract XXV. In the Royal Artillery the admission ratio was 1000·0, and the constantly sick rate 65·58 per 1,000, both being below the corresponding rates in the previous year. There was one death as compared with three in 1895. In the Infantry the ratio of admission was 1175·6 per 1,000, the death rate 7·23, and the constantly sick rate 79·91, all of which show very little difference in comparison with corresponding ratios in the preceding year. In the detachments Royal Engineers and Departmental Corps, the sick ratios were small, but in the former there were 2 deaths.

Taking the sickness and mortality according to age it is found that among men under 20 years of age the admission rate was 1565·2 per 1,000, among men between 20 and 25 years of age 986·9 per 1,000, among men between 25 and 30 1366·1 per 1,000, and among men of 30 years of age and upwards 507·1 per 1,000. In the previous year the highest admission ratio was among men between 20 and 25 years of age. There was one death among men between 20 and 25 years of age, giving a

Straits Settlements.

ratio of 1·30 per 1,000; 3 between 25 and 30, or 6·86 per 1,000; and 6, or 47·62 per 1,000, among men over 30 years of age. No death occurred among men under 20 years of age. With regard to the influence of length of service in the Command, the admission rate among men in their first year of service was 1264·6 per 1,000, among men in their second year 1038·2 per 1,000, among men in their third year 440·7 per 1,000, and 607·1 among men over three years' service in the Command. In the previous year the highest ratio was among men in their first year of service in the Command. The mortality rate was 9·55 per 1,000 among men in their second year, and 33·90 per 1,000 among men in their third year of service.

In Abstract XIV. will be found the statistics of the sickness, mortality, and invaliding arranged according to the different groups and orders of diseases.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—There were no cases of *eruptive fevers* recorded among the troops during the year, and only one case of *enteric fever*. *Other continued fevers* caused 83 admissions, or 61·4 per 1,000, as compared with a ratio of 52·6 per 1,000 in the previous year, and of 68·8 per 1,000 for the preceding ten years. *Dysentery* caused 3 admissions, being in the ratio of 2·2 per 1,000, exactly half the corresponding rate in the previous year, and 5·2 below the decennial average rate. 15 cases of *influenza,* and one case of *mumps* complete the number of admissions in the first sub-group of diseases. Of the cases of influenza, 11 occurred in Tanglin, where it is said to be endemic. The Senior Medical Officer considers them to have been cases of fever resulting from the prevalence of the Java winds and not cases of an infective catarrhal disease.

Malarial Fevers.—The admissions numbered 144, equal to a ratio of 106·5 per 1,000, which is higher than the corresponding ratio in the previous year by 59·7, but below the average rate by ·2. The cases were distributed as follows; at Tanglin 67 of ague (1 fatal), and 8 of remittent fever (2 fatal); at Fort Canning 50 of ague, and two of malarial cachexia; and at Penang 14 of ague, one of remittent fever, and one of malarial cachexia. Most of the cases occurred in the 2nd Battalion Northumberland Fusiliers who are stated to have been saturated with malarial disease in India.

Venereal Diseases.—There were 227 admissions for *primary syphilis,* being in the ratio of 167·9 per 1,000, which is lower than the corresponding rate in the previous year by 73·3, but above the average rate by 56·7. Including the sickness from simple venereal ulcer, (54 admissions and 3·45 constantly sick), the admission ratio for primary venereal sores was 207·8 per 1,000, which, though below the previous year's rate by 67·0, is above the average rate by 20·9. *Secondary syphilis* caused 181 admissions, and 1 death, the admission ratio being 133·9 per 1,000, which shows a decrease of 5·0 as compared with the rate for 1895, but is above the decennial average rate by 35·0. *Gonorrhœa* was the cause of 240 admissions, or a ratio of 177·5 per 1,000, a decrease of 32·3 on the previous year's rate, but above the average rate by 25·9. Including all forms of venereal disease the admissions amounted to 702, and the number constantly sick to 58·20, the former constituting almost half the total admissions to hospital from all causes. The admission ratio was 519·2 per 1,000, which, though below the corresponding rate in the previous year by 104·3, is above the average rate by 71·8. The total amount of constant inefficiency from these diseases was 43·04 per 1,000, which is below the rate in 1895 by 2·68, but above the average rate by 6·71. At Tanglin it is observed that the type of venereal disease is more severe than in the other stations.

Parasitic diseases caused 2 admissions, both being cases of tœnia solium.

Alcoholism caused 3 admissions as compared with 6 in the previous year. There were no cases of delirium tremens.

Debility.—Under this head 5 admissions are recorded, being in the ratio of 3·7 per 1,000, a slight increase on the previous year's rate, but below the average rate by 11·7.

Rheumatism caused 27 admissions, being in the ratio of 20·0 per 1,000, which is above the corresponding rate in the previous year by 7·6, and the decennial average by 7·5. Four cases of rheumatic fever occurred.

Tubercular Diseases caused 2 admissions and one death, that of an invalid after leaving the Command, as compared with 6 cases and 1 death in 1895. All were cases of tubercle of the lungs. The 7 remaining admissions in this

Straits Settlements.

group of diseases comprised 4 of non-malignant new growth, 2 of anæmia, and 1 of scrofula.

LOCAL DISEASES.—*Diseases of the Nervous System.*—18 admissions and 2 deaths are returned. The admission ratio, 13·4 per 1,000, shows a considerable increase, as much as 11·2 and 6·1, on the corresponding rates in the previous year and decennial period respectively. The cases were 11 of neuralgia, 2 of epilepsy, 2 of mental disease (1 mania, 1 toxic insanity), 2 of inflammation of cerebral membranes (both fatal), and one of neuritis (from effects of drink).

Diseases of the Eye caused 26 admissions, equal to a ratio of 19·3 per 1,000, as compared with 7·3 in the previous year, and 18·0, the decennial average rate. 25 of the admissions were due to conjunctivitis.

Diseases of other Organs of Special Sense were the cause of 8 admissions, or 5·9 per 1,000, which is below the previous year's rate by 8·0, and the average rate by 8·5. All the admissions were for aural affections.

Diseases of the Circulatory System were the cause of 4 admissions, or 3·0 per 1,000, which is above the previous year's rate by ·8, but below the average by 1·8. The cases were palpitation 3, and endocarditis 1.

Diseases of the Respiratory System—19 admissions are returned, being in the ratio of 14·1 per 1,000, which is above the previous year's rate by 1·7, but below the average rate by 7·4. Of the admissions, 12 were for bronchial affections, 4 for pleurisy, 2 for pneumonia, and 1 for laryngitis.

Diseases of the Digestive System caused 70 admissions and 3 deaths (including an invalid), being in the ratio of 51·8 and 2·22 per 1,000 respectively. The admission rate is above the corresponding rate in the previous year by 18·9, but below the decennial average rate by 17·1. Dyspepsia and diarrhœa were the chief causes of admission. The deaths were one each from diarrhœa, jaundice, and peritonitis.

Diseases of the Lymphatic and Glandular System were the cause of 51 admissions, equal to a ratio of 37·7 per 1,000, which is below the previous year's and average rates by 8·3 and 2·0 respectively. Of the 51 admissions 46 were cases of inflammation of lymph glands.

Diseases of the Urinary System caused only 3 admissions, as compared with 7 in the previous year. All the cases were due to inflammation of the bladder. There was one death from acute nephritis.

Diseases of the Generative System.—64 admissions are returned, of which 54 were for simple venereal ulcer. The admission ratio, 47·4 per 1,000, though showing only a slight difference as compared with the previous year's rate, is lower than the decennial average rate by 49·3.

Diseases of the Organs of Locomotion gave an admission ratio of 9·6 per 1,000, which is lower than the previous year's rate by 6·0, and than the average rate by 2·1. Out of 13 admissions 10 were cases of synovitis.

Diseases of the Connective Tissue.—38 admissions gave a rate of 28·1 per 1,000, which is only a fractional decrease on the rate in the previous year, but 4·5 below the average rate.

Diseases of the Skin caused 75 admissions, or 55·5 per 1,000, which is above the ratio in the preceding year by 7·3, but below the decennial average rate by 14·0. The chief causes of admission were ulcer 41 cases, ringworm 14, and whitlow 6.

Injuries.—115 admissions are returned, the ratio being 84·5 per 1,000, which is practically the same as the previous year's rate, but 12·0 below the average. The majority of the admissions comprised sprains (41), wounds (39), contusions (15), fractures (10), and dislocations (4). One of the injuries was caused by the accidental explosion of an electric detonator charged with 30 grains of fulminate of mercury; the patient, who was examining it at the time, sustaining severe injury to the head. There was one death from gunshot wound of head, self-inflicted. The man had been drinking heavily, but no motive for the act was assigned.

Invaliding.—The number of men invalided home during the year was 20, being in the ratio of 14·79 per 1,000, which is above the corresponding rate in the preceding year by 1·63, but below the average rate of the preceding ten years by 2·50. Of the men invalided, 4 belonged to the Royal Artillery, the rate being 15·09 per 1,000; 3 to the Royal Engineers, or 36·59 per 1,000; and 13 to the Infantry, or 13·43 per 1,000. With regard to age, 10 men were

Straits Settlements.

invalided who were between 20 and 25 years of age, the rate being 13·05 per 1,000; 7 men, or 16·02 per 1,000, were between 25 and 30 years of age, and 3 men, or 23·81 per 1,000, were over 30 years of age. With regard to length of service in the Command, 4 men, equal to 9·37 were in their first year; 14 men, or 16·71, were in their second year of service; and 2 men, or 33·90 per 1,000, were in their third year of service in the Command. The principal causes of invaliding were secondary syphilis 7 cases, or 5·18 per 1,000; rheumatism 5 cases, or 3·70 per 1,000; and diseases of the nervous system 2 cases, or 1·48 per 1,000.

The number of men finally discharged as medically unfit for further service was 3, being in the ratio of 2·22 per 1,000, which is 5·09 below the corresponding rate in the previous year, and 7·72 below the decennial average. The disabilities necessitating discharge were tubercle of lung 2 cases, and epilepsy one case.

Officers.—The average strength of officers was 51, and there were 33 attacks of illness, but no deaths. The ratio of admission was 647·1 per 1,000, an increase of 126·3 on the corresponding rate in the previous year. The chief causes of sickness were influenza and fevers, principally of the simple continued type. One officer was invalided for debility.

Women.—The average strength was 52, and there were 43 cases of sickness, and 1 death. The ratio of admissions was equal to 826·9 per 1,000, which is higher than the corresponding rate in 1895 by 46·9. Among the cases treated were 8 of malarial fever, 8 of debility, 5 of disorders of the digestive system, and 4 of simple continued fever. The death was due to tubercular disease of the lungs.

Children.—The average strength was 103, and there were 89 attacks of illness and 2 deaths. The ratio of admission was 864·1, and the mortality rate 19·42 per 1,000. The cases treated included 16 of bronchitis, 11 of malarial fever, 9 of continued fevers, 8 of whooping cough, 6 of debility, and 5 of measles. The deaths were due to tubercular meningitis, and inflammation of cerebral membranes, one case each.

Vaccination and Small-pox.—There were no cases of small-pox in the Command during the year. A single instance of primary vaccination from arm to arm in a child was successful. There were two arm to arm revaccinations amongst the women, both being failures. Of 10 primary vaccinations with preserved lymph amongst children one was a failure, and of 8 revaccinations with preserved lymph amongst the men, 2 were failures.

Sanitary Conditions.—The Senior Medical Officer, Surgeon-Colonel N. B. Major, reports that the general sanitary condition of the barracks, &c., in the Command is satisfactory, and that no disease has been attributed to bad sanitation. It is generally noted that the pail system of conservancy in the Command might be improved by the use of dry earth. Khaki drill clothing was introduced during the year in place of white clothing. At *Fort Canning* in the earlier part of the year, there was overcrowding, which was relieved by transferring the 38th Company Southern Division Royal Artillery to Blakan Mati. Whooping cough, cholera, enteric fever, and small-pox were all prevalent amongst the civil population, but the troops escaped. Measles was introduced by children from on board ship, but gave rise to no epidemic. The drainage at Fort Canning was improved by the acquisition of new absorption areas near the foot of the hill. The urinal at the station hospital was reconstructed. The latrines, on the dry earth system, are badly situated, and their construction does not admit of sufficient perflation. The effluvia is said to be a nuisance, and to pervade the hospital wards when the north-east wind is blowing. The water supply at Fort Canning is from the municipal water-works, and is conveyed to the Fort in barrels. It is said to be good and sufficient. At *Blakan Mati* new barracks have been completed, but were not in occupation during the year, the Royal Artillery Companies on the island being housed in attap huts. The situation of the new barracks is elevated, on the brow of a hill, and well exposed to sea breezes. The drainage is surface drainage only. A pail system of conservancy is in use, the contents being emptied into the sea. The water supply is from shallow wells, but is stated to be of good quality and abundant. It is boiled and filtered before use. There are no civil inhabitants on the island, and the sanitary conditions

Straits Settlements.

generally are satisfactory. On *Pulo Brani* island, which is occupied by the Royal Engineers, new barracks and married quarters were taken into occupation in June. These barracks consist of one block of officers' quarters, a 2-storied block for the men, a sergeants' mess, and two 2-storied blocks for the married families. The men's block is built to contain 50 men. The ground floor is constructed of brick work, and the first floor of match-boarding, the roof being tiled. The barrack rooms are on the first floor, and are amply ventilated by roof ventilation, louvred openings, and jalousies. The ground floor contains the library, chapel, and other regimental institutions. The married quarters are similarly constructed. The situation is elevated, and exposed to sea breezes. There is only surface drainage; the water supply is brought from Blakan Mati in tank boats, and the sanitary conditions generally are satisfactory. There are two native villages on the island, consisting of huts raised on piles on the shore, below high water mark, so that all refuse, &c. is carried away by the tide. At *Tanglin* it is stated that the new urinals are not satisfactory, and that the means of ablution were at one time insufficient. The pail system of conservancy is in force, the contents being disposed of for agricultural purposes. The drainage is surface drainage only. The water supply is from surface wells, boiled and filtered before use. The supply is not considered satisfactory, and it is hoped that the municipal water supply will shortly be laid on to the barracks. At *Penang* the water supply is a continuous supply from the municipal water-works, and is said to be excellent. There is a pail system of conservancy, the contents being disposed of in gardens. The general sanitary condition of the barracks and hospital is considered in every respect satisfactory.

With regard to the non-European troops in the Command, it is noted that there is insufficient hospital accommodation, but that a new hospital is being built at Blakan Mati. The general health of the troops was very good, no particular disease being prevalent. These troops are stationed at Blakan Mati and Pulo Brani islands. It is noted that they receive a money allowance in lieu of rations.

II.—Asiatic Troops.

The force consisted of the Singapore Company, Royal Artillery, with an average strength of 110, at Blakan Mati, and the Singapore Company, Royal Engineers, with an average strength of 49, at Pulo Brani; the former are Mahomedans recruited from India, and the latter are Malays. The total number of admissions was 52, and the average number constantly sick 2·92, giving ratios per 1,000 of 327·0 and 18·36 respectively, both being below the corresponding ratios in the previous year, the former by 281·4, and the latter by 12·48. Among the admissions were 10 cases of venereal disease. Two fatal cases occurred, one from dysentery (a man on furlough in India), and one from valvular disease of the heart.

Under local injuries, a case of some interest is recorded. A native gunner of the Singapore Company, Royal Artillery, while bathing, was stung on the foot by a poisonous fish, known amongst the Malays as the "Ikan Tapoh," which causes some deaths every year amongst the natives. The symptoms are briefly intense pain at the point of insertion, with acute erysipelatous inflammation of the skin extending up the whole extremity, effusion into the connective tissue, pain on the slightest touch, pyrexia, furred tongue, and malaise. Treatment consisted in applying acetate of lead lotion, and administering ammonia internally. After 15 days the patient was able to resume his ordinary duties.

III.—ON THE HEALTH OF THE TROOPS SERVING IN INDIA.

Sickness and Mortality.

India.

The average strength of the troops serving in India during the year was 70,484 warrant officers, non-commissioned officers and men, as compared with 68,331 in 1895. In the latter year the strength of the troops employed with the Chitral Relief Force and in Waziristan was not included.

In the following table are given the more important statistics of sickness and mortality among the troops during the year:—

1896. — Average Strength.	Admissions.	Deaths			Invalids		Average constantly Sick.	Ratios per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.
70,484	97,738	1,046	32	1,078	1,966	880	6614·74	1386·7	15·29	27·89	12·48	93·85

Compared with the corresponding ratios in the preceding year a decrease of 73·3 per 1,000 is observed in the ratio of admission, while those of mortality and constantly sick show an increase of ·98 and ·24 respectively. Compared with similar average ratios for the preceding ten years there is a decrease of 66·8 in the admission rate, and one of ·23 in the mortality rate, but the ratio of constant inefficiency through sickness has increased by 10·93.

The average sick time to each soldier was 34·35, and the average duration of each case of sickness 24·77 days. Compared with the previous year the average sick time was longer by ·18 of a day, and the average duration of each case by 1·37 days; while in comparison with similar averages for the preceding ten years there is an increase of 4·09 days in the former, and of 3·95 days in the latter.

The loss to India by deaths and invaliding to England was 3,012 non-commissioned officers and men, being in the rate of 42·73 per 1,000, an increase of 4·60 on the rate in the previous year, and the loss to the army by death and final discharge as medically unfit for further service among the troops in India was 1,958, or 27·77 per 1,000, an increase of 1·45 on the ratio for 1895.

In Abstract XV. is a table taken from the report of the Principal Medical Officer showing the prevalence of sickness and mortality in the different military districts, from which it will be seen that the highest admission rate, namely, 2458·6 per 1,000, occurred in the Deesa district, being followed by 1979·1 and 1949·1 in the Sind and Narbudda districts respectively, the first and last-mentioned districts being higher by 586·9 and 295·3 respectively, while the second named district was lower by 865·8 than the corresponding ratios in 1895, in which year the highest ratios occurred in the Sind, Lahore, and Deesa districts in the order named; the ratio in the Lahore district shows a decline of 673·4 as compared with that for the preceding year. The prevailing diseases in the Deesa and Narbudda districts were malarial fevers and venereal affections, while in the Sind district more than a third of the admissions was caused by malarial fevers alone. The lowest admission

India.

rate was 1065·1 in the Bangalore district, the next lowest being 1106·1 and 1131·5 in the Nagpur and Rawal Pindi districts. In 1895 the two lowest ratios were also in the Bangalore and Nagpur districts, but were then lower by 106·6 and 60·9 than in the year under report. Among districts other than those referred to above which show an increase of admission rate Belgaum stands highest, the ratio of admission being greater by 138·4 than in the previous year, and in the Madras and Sirhind districts an increase of 117·1 and 116·2 per 1,000 respectively is observed. The Quetta, Poona, and Presidency districts show a decrease of 311·5, 194·4, and 193·1 respectively. The highest rate of mortality was in the Deesa district, 31·46 per 1,000, the next highest being 28·08 in the Allahabad and 26·60 in the Narbudda district. These high ratios were due principally to diseases of the respiratory system, injuries, and malarial fevers in the first, to enteric fevers and cholera in the second, and to enteric fever, dysentery, and diseases of the digestive system in the last instance. In the preceding year the Peshawar district gave the highest mortality rate, followed by the Narbudda and Aden districts. Compared with the ratios for that year increase is observed in 14 districts, varying from 17·38 and 13·60 per 1,000 in the Deesa and Allahabad districts to ·46 in the Bombay district. The districts showing the greatest decrease were Peshawar, Aden, Meerut, Madras, and Sind, the ratios being lower than in 1895 by 13·15, 12·43, 5·19, 4·28, and 3·72 respectively.

In Abstract XVI. will be found the statistics of sickness and mortality at the various stations.

Taking first the stations in the plains having an average strength of over 150 men, it is found that Ahmedabad gave the highest admission rate, 3417·4 per 1,000, which is higher than the corresponding rate in the previous year by 1095·4, and than the average rate for the previous ten years by 1149·9. Malarial fevers and venereal diseases were the principal causes of the increase. Neemuch comes next with 2455·7, which is higher than the previous year's rate by 13·8, and than the average by 711·3, malarial fevers furnishing nearly half and venereal diseases more than a third of the cases. The third highest ratio, 2299·4, occurred in Nowgong, higher than the previous year's rate by 277·8, and above the decennial average rate by 302·4; the principal causes of the increase being due to malarial fevers and venereal diseases. The next ratio was 2232·4 at Bhamo, 462·8 higher than that for 1895, but 8·3 lower than the average rate for the preceding eight years. The lowest ratio for admission was 913·2 per 1,000 at Campbellpore, as compared with 1350·3 and 1610·1, the ratios for the preceding year and the decennial average; Sialkot, which was second lowest also in the year preceding, comes next with 914·0, higher than in 1895 by 70·6, but below the average by 614·4; the next lowest being Dum Dum with 955·1, lower than the previous year's rate by 222·9, and the decennial average by 719·3. Of the 62 stations the admission rates for 33 were higher than in 1895, the most notable being, in addition to those already mentioned, an increase of 518·7 at Nowshera, one of 516·5 at Nasirabad, and of 507·2 at Fort Allahabad; while in 29 stations the rates decreased, instances of considerable diminution being 1022·3 at Mian Mir, 951·2 at Karachi, and 610·6 at Amritsar. Compared with the average ratios of the preceding ten years the admission rates were higher in 24 stations, notably, in addition to those already mentioned, at Deesa, where an increase of 622·5 is observed, and at Nasirabad and Jubbulpore, where the rates were 335·7 and 315·4 respectively in excess of the average, while decrease occurred in 38 stations, including 1076·8 at Fort Attock, 966·1 at Amritsar, and 722·4 at Mian Mir. The mortality rate was highest, 47·83 per 1,000, at Ahmedabad, the ratio for 1895 being 18·94 and the average rate 22·22; next in order came Benares with 43·48, higher than the previous year by 22·20, and than the average rate by 21·88, 9 of the 16 deaths in hospital being due to enteric fever and 4 to cholera. The third highest rate was 37·61 at Allahabad, above the last year's rate and the average of the preceding ten years by 27·65 and 17·25 respectively, 29 deaths being due to enteric fever. At Kirkee the death rate was 34·20, higher in the two comparisons by 26·18 and 25·06 respectively. The lowest ratio of mortality was 1·85 per 1,000 at Thayetmyo, the next lowest being 2·12 at Shwebo (third lowest with 4·28 in 1895), 6·49 at Ahmednagar and 6·62 at Shahjahanpur. Of the 62 stations

33 had ratios exceeding those of the previous year. Besides those already referred to may be mentioned Bhamo with a ratio of 16·60 against *nil* in 1895 and 21·24, the average of the preceding eight years, Nasirabad with an increase of 14·45 and 5·26 as compared with the previous year's rate and the decennial average respectively, and Fort Allahabad, where the rate was 13·71 and 6·01 above the previous year and preceding ten years' average respectively. The most notable instances of decrease were in Peshawar, where the rate was 18·28 as compared with 32·99 and 24·91, the previous year's and the decennial average ratios; Barrackpore with 25·14, as against 39·63 and 18·39; and Aden, where the rate was less than in the previous year by 12·43 and below the average by 6·27.

Among the ten hill or convalescent depôts it is found that Pachmarhi, as in 1895, gave the highest admission ratio, 2265·5 per 1,000, which is 120·5 below the corresponding rate in the previous year, but 518·1 above the decennial average rate; the next highest ratio was, as in the previous year, at Deolali, 2143·0, as compared with 2219·9 in 1895 and 1542·4, the average rate; Kasauli came third with 1508·0, lower than the previous year by 95·7, but higher than the average of the preceding ten years by 7·3. At Darjeeling and Landour the admission rates, though above those for 1895 by 39·6 and 65·3, were below the average rates by 152·1 and 519·4 respectively; at both depôts the increase was due chiefly to malarial fevers and venereal affections. The remaining five stations gave ratios comparing favourably with both those for the preceding year, and with the average rates, as follows:—Poonamalee, 1446·3, lower by 628·9 and 795·9; Naini Tal, 1155·6, lower by 237·3 and 596·1 ;· Khandalla, 1022·0, lower by 367·6 and 229·1; Dalhousie, 954·1, lower by 1199·1 and 576·7; and Murree, 271·6, lower by 243·6 and 1094·2 respectively. The mortality ratio was highest at Pachmarhi, 70·80 per 1,000, being 44·48 higher than that of the year preceding and 51·73 above the decennial average; 3 of the 8 deaths being due to enteric fever, and 2 to remittent fever. The next highest ratio, 37·04, occurred at Murree, where the rate in 1895 was 60·61 (the highest in that year), the average rate being 42·21. At Khandalla, Naini Tal, and Deolali the death rates, 32·97, 29·63, and 15·12, were higher in the two comparisons by 7·00 and 28·51, 11·77 and 9·05, and 1·37 and 1·85 respectively. At Kasauli, Dalhousie, and Darjeeling the mortality rates, though above those for the preceding year by 10·71, 2·50, and 1·85, were below the average rates by 1·84, 3·22, and 3·61 respectively. Next to Murree, the largest decrease is observed in the rate for Poonamalee, which is lower than in 1895 by 22·51, and below the average rate by 22·56, and the next largest at Landour, where the ratio is lower in the two comparisons by 13·01 and 15·73 respectively. As in preceding years, Darjeeling, Dalhousie, Pachmarhi, and Deolali were also garrisoned by a portion of healthy men.

Of the principal hill stations garrisoned by healthy troops, and having an average strength of over 150 men, Subathu gave the highest admission ratio, 1705·4 per 1,000, which is above the previous year's rate by 617·1, and above the average rate for the previous ten years by 507·7; enteric fever, malarial fevers, venereal affections, and sore throat were the principal causes of the increase. The next highest rate was at Thobba, 1662·4, higher in the two comparisons by 427·1 and 441·6, the increase being due to malarial fevers and venereal diseases, followed by Ranikhet with 1502·9, above the preceding year's rate by 204·6 and the average rate by 296·0, venereal diseases furnishing nearly half of the cases. The lowest rate occurred at Cherat, 386·2 per 1,000, as against 1118·2 in 1895, and 1173·9, the average rate; the next lowest being 686·5 at Bernardmyo, lower than the rate of the previous year and the average rate by 130·0 and 476·2 respectively. The highest mortality rate was 42·41 at Subathu, above the previous year's rate by 34·73 and in excess of the average rate by 28·97, 15 of the 19 deaths being due to enteric fever. Dagshai came next with 17·83 against 6·29 and 13·00 in the two comparisons, 11 of the 14 deaths being due to enteric fever, and Jutogh third with 17·02, as compared with 21·83 in the previous year and 10·09, the ten years' average. At Ranikhet and Cherat the rates were 16·35 and 13·49 respectively. At no other station did the rate amount to 10, the lowest, viz., 1·91, being at Wellington, while at Thobba, Ghora Dhaka, and Bernardmyo no deaths occurred.

India.

In Abstract XXVI. will be found the more important of the statistics of sickness and mortality of the different arms of the service as well as of the individual corps which served in the country during the year.

The average strength of the Cavalry was 5,402, and there were 6,621 admissions into hospital and 76 deaths in India, the average number of men constantly inefficient on account of sickness amounting to 447·01; the ratio of admission was 1225·7, that of mortality 14·07, and that of constantly sick 82·75 per 1,000 of strength. Compared with corresponding figures for 1895, the admission and constantly sick rates have declined by 11·7 and 5·37 respectively, but the mortality ratio has increased by ·83. The average sick time to each soldier, 30·29 days, is shorter than in the previous year by 1·88 days, and the average duration of each case of sickness, 24·71, is also shorter by 1·29 days.

In the Artillery, with an average strength of 12,162, there were 16,354 admissions into hospital, 188 deaths, and 1051·98 men were constantly sick, giving ratios of 1344·7, 15·46, and 86·50 in each instance. Compared with the ratios for the previous year there is a decrease of 68·0 in the admission rate and of ·20 in the constantly sick rate, but the mortality ratio has increased by ·26. The average sick time to each soldier was 31·66 days, only ·01 of a day more than in 1895, and the average duration of each case of sickness, 23·54 days, 1·14 more than in the year preceding.

The Infantry had an average strength of 49,191, with 70,706 admissions into hospital, 760 deaths, and 4761·45 men constantly sick, or ratios of 1437·4 per 1,000 for admissions, 15·45 for mortality, and 96·80 for constantly sick, lower than in 1895 by 89·3 in the admission rate, but higher by 1·61 and ·20 respectively in the death and constantly sick rates. The average sick time to each soldier was 35·43, and the average duration of each case of sickness 24·65 days, longer than in the year preceding by ·17 of a day and 1·55 days respectively.

The following table shows as far as possible the statistics of sickness, mortality, and invaliding among the troops according to age:—

Ages.	Average Strength.	Admissions.	Deaths.	Invaliding.	Ratios per 1,000 of Strength.		
					Admissions.	Deaths.	Invaliding.
Under 20 years	1,864	2,077	24	27	1114·3	12·88	14·48
From 20 to 25 years	36,464	62,515	648	1,189	1714·4	17·77	32·61
,, 25 ,, 30 ,,	24,459	28,735	275	618	1174·8	11·24	25·27
,, 30 ,, 35 ,,	4,690	3,295	64	87	702·6	13·65	18·55
,, 35 ,, 40 ,,	1,493	853	23	27	571·3	15·41	18·08
,, 40 and upwards	386	235	12	18	608·8	31·09	46·63
Not stated	1,128	28	—	—	24·8	—	—
Total	70,484	97,738	1,046	1,966	1386·7	14·84	27·89

The ratio of admission among men under 20 years of age was 1114·3, and the highest ratio at any period of age was 1714·4 per 1,000 among men between 20 and 25 years. In the remaining age-groups a steady decline is observed, the ratios being 1174·8, 702·6, and 608·8 among men between 25 and 30, 30 and 35, and 40 years of age and upwards respectively, the lowest being 571·3 among men between 35 and 40 years of age. In the first three periods exactly the same sequence of ratios occurred in the previous year; there was, however, a slight difference in this respect regarding the other

India.

quinquennial periods. The largest decrease in the admission rate occurred in men between 35 and 40 years of age, 116·9 per 1,000; the next greatest decrease was 115·7 among men from 20 to 25 years. There was also a decrease in admissions among men from 25 to 30 and under 20 years of age, amounting to 20·9 and 1·2 respectively. The two instances of increase were 53·1 and 7·8 in men from 30 to 35 and over 40 years of age respectively. It will be observed that the highest ratio for mortality occurred, as in the preceding year, among men over 40 years of age, the next highest among men between 20 and 25, and the lowest among men between 25 and 30 years of age. All the ratios were higher than in the preceding year, except for the quinquennial period 35 to 40 years, which showed a decrease of 3·67 per 1,000. The greatest increase, 11·14, occurred among men over 40 years of age, and the next, 7·59, among men under 20 years of age, the increase among men from 30 to 35 years and the two preceding quinquennial periods being 2·35, ·96, and ·87 respectively.

The following table is given to show as far as possible the influence of length of service in India on the sickness, mortality, and invaliding among the troops:—

Length of Service in India.	Average Strength.	Admissions.	Deaths.	Invaliding.	Ratios per 1,000 of Strength.		
					Admissions.	Deaths.	Invaliding.
Under 1 year - -	11,250	20,041	247	267	1781·4	21·96	23·73
1 to 2 years - -	12,965	19,468	231	519	1501·6	17·82	40·03
2 „ 3 „ - -	11,779	17,873	162	333	1517·4	13·75	28·27
3 „ 4 „ - -	11,577	14,942	129	315	1290·7	11·14	27·21
4 „ 5 „ - -	8,954	10,827	96	228	1209·2	10·72	25·46
5 „ 10 „ - -	10,848	13,305	146	258	1226·5	13·46	23·78
10 years and upwards	2,025	1,254	35	46	619·3	17·28	22·72
Not stated - -	1,086	28	—	—	25·8	—	—
Total -	70,484	97,738	1,046	1,966	1386·7	14·84	27·89

It will be observed that the admission rate was highest among men in their first year of Indian service, that of men in their third and second years, whose ratios are nearly identical, coming next, followed by men in their fourth, those between five and ten years, and those in their fifth year of service, the lowest being among men of over ten years' service. In the preceding year the highest ratio occurred among men in their first and second years of service, which had practically the same ratios, and declined in the fourth, third, fifth, and succeeding periods of service in the order named. Comparing the admission rate of 1896 with that of 1895, it is found that there was an increase among men in their first and third years of service and among those who had been in India for ten years or more, but a decline among men at other periods of service; the greatest increase, 100·8, was among men in their first year's service (in 1895 the largest decrease was among men in their first year), followed by 72·9 and 16·6 among those in their third and above their tenth year of service, the largest decrease, 185·4, being among men in their second year of service, followed by 157·5, 102·9, and 69·5 in those in their fourth and fifth years and between five and ten years respectively. With regard to mortality, the highest ratio was among men in their first year, the next among men in their second year, followed by that among men of over ten years' service. The lowest mortality was among men in their fifth year of service. In the preceding year also the two highest death rates occurred nIdia.

among men in their first and second years of Indian service, and the lowest among men in their fifth year of service, the sequence of the other ratios differing slightly from that in the year under report. Compared with the corresponding figures for 1895, all the mortality rates show an increase, the greatest 4·88, being among men of over ten years' service, the next, 2·20, among men in their fifth year, followed by 2·15 among those in their first year, 1·47 in their third, 1·36 in their second, and ·58 among men between their fifth and tenth years of service. The lowest increase was ·17 among men in their fourth year of service.

In Abstract XIV. will be found a table showing the admissions, deaths, invaliding, &c., according to the different groups and orders of diseases, and in Abstract XV. will be found the sickness and mortality from the same in each of the military districts in India.

General Diseases.—*Diseases dependent on Morbid Poisons.—Eruptive Fevers* caused 204 admissions into hospital and 12 deaths. 122 of the admissions and 10 deaths were due to *small-pox.* The largest number of cases occurred at Bangalore, 17 admissions and 2 deaths; these cases occurred 10 in March, 6 in April, and 1 in May, and were distributed through all the barracks; in one instance only were two cases admitted from the same barrack. In the Dorsetshire Regiment, which suffered most, probably from its near proximity to bazars, 11 cases occurred as against 1 in the Cavalry and 5 in the Artillery. All the men bore marks of vaccination, and the disease, except in three men, ran a modified course. Of the two fatal cases, one was of the malignant and the other of the confluent type, both being very severe. At the time of the occurrence of these cases, small-pox was of exceptional severity amongst the civil population, scarcely any portion of the station being free. At Allahabad there were 16 admissions early in the year, the cause of the outbreak being probably direct contagion through natives, as the disease was epidemic at the station. All the men bore marks of previous vaccination. At Umballa there were 9 admissions and 2 deaths; six of the cases bore marks of satisfactory vaccination, four having a modified form of the disease, the fifth a typical attack, and the sixth a confluent and fatal one. This last case was re-vaccinated two days before admission. Three patients bore doubtful marks of vaccination, one had the modified type, one the confluent, and the other the malignant form, which proved fatal; this man had been twice unsuccessfully re-vaccinated. At Rawal Pindi there were also 9 admissions but no deaths; most of the cases occurred early in the year and were not of a severe type. All the men had satisfactory marks of vaccination or re-vaccination. There were 7 admissions at Mian Mir; the cases occurred towards the end of the year when small-pox was very prevalent in the Sadr-bazar, Lahore city, and surrounding district. It is suspected that the men contracted the disease through their underclothing being washed in dirty tanks or pools where infected clothing of natives was also washed. Meerut had 6 admissions; 4 of the cases occurred in the Artillery, probably contracted at the Gurgaon Camp of Instruction, and the remaining two in the Meerut bazar, where a number of cases had occurred at the time; the type was mild. All the men bore marks of vaccination. At Lucknow there were 5 admissions; the cases occurred between the middle of March and the first week in April, and only one was of any severity. All the patients bore good marks of vaccination, and only two belonged to the same regiment; the disease was probably contracted independently by each in the bazars where small-pox was at the time extremely prevalent. Agra had 5 admissions and 1 death; the disease was probably imported from Delhi by the 24th Field Battery. Royal Artillery; in the fatal case the hæmorrhagic type appeared. There were 4 admissions each at Fort Allahabad and Nasirabad, 3 admissions and 1 death at Quetta, 3 admissions each at Cawnpore, Jhansi, Ferozepore, Poona, and Mhow, 2 admissions and 1 death at Deesa, 2 admissions each at Multan, Nowshera, and Deolali, and on the line of march, 1 admission and 2 deaths (one being a transfer from the march) at Bareilly, and 1 admission each at Sitapur, Muttra, Landour, Fort Lahore, Dalhousie, Sialkot, Secunderabad, Meiktila, Neemuch, and Karachi. It will be observed that small-pox occurred in 32 different stations. There were 5 admissions for *cow-pox* (one each at Umballa, Fort Lahore, Gharial, Shwebo, and Mhow), 8 for *chicken-pox* (2 each at Sialkot and Poona, and one each at Umballa, Mian Mir, Ahmedabad, and Cawnpore), 19 admissions for and one death from *measles* (3 admissions at Aden, including the fatal case, 4 admissions each at Fort William and Bangalore, 2 at Agra, and 1 each at Dinapore, Naini Tal, Dagshai, Nowshera, Poona, and Hyderabad), 15 admissions for *epidemic rose-rash* (5 each at Saugor and Bangalore, 2 each at Mhow and Quetta, and one at Bombay), 8 admissions for and one death from *scarlet fever* (the fatal case at Quetta, 5 admissions at Ranikhet, and one each at Sitapur and Hyderabad), and 27 admissions for *dengue*, all at Allahabad. The ratio of admission for small-pox was 1·7, against ·3 in the previous year, and ·7, the average ratio for the preceding ten years. The mortality ratio was ·14 as compared with ·03 in 1895 and ·07, the decenniai average rate. *India.*

Enteric Fever.—This disease caused 1,795 admissions into hospital, 445 deaths, and the constant sickness of 259·86 men, being in the ratios of 25·5, 6·31, and 3·69 per 1,000 respectively. Compared with similar ratios for the preceding year the three rates show an increase of 2·9, ·70, and ·47 respectively; in comparison with the average rates for the previous ten years increase is also observed, equal to 6·3 in the case of admissions, 1·15 in that of mortality, and ·99 in the rate of constant inefficiency. The per-centage of mortality to attack was 24·8, similar to that in 1895, the average per-centage for the previous ten years being 26·9. In Abstract XVII. the occurrence of enteric fever at each station and in each quarter of the year is shown The third quarter had the largest number of attacks, the second, fourth, and first quarters following in the order named, but the deaths were greatest in the second quarter, followed by the third, first, and fourth quarters. The percentage of mortality to attack was highest in the second quarter, 28·9, followed by the first, third, and fourth quarters with 24·6, 23·2, and 21·4 respectively; in the preceding year the per-centage was also highest in the second quarter, followed by the third, first, and fourth.

The disease occurred in every district, and, with eighteen exceptions, in every station in India. The eighteen exceptions were at Fort Fulta, Fort Chingrikhal, Darjeeling, Landour, Fort Attock, Bara Gali, Kalabagh, Ghora Dhaka, Murree (there was a death at this station from the previous years' admissions), Poonamallee, Ramandroog, Thayetmyo, Meiktila, Bhamo, Bernardmyo, Taragarh, Khandalla, and Mount Abu. The highest ratio of admission was 67·8 per 1,000 in the Allahabad district, which stood fifth in 1895 with a ratio of 36·2, followed by 60·5 in Quetta, being an increase of 48·6. The Sirhind district, which also stood third in 1895, comes next with 53·5, an increase of 13·2; followed by Peshawar, which was second in 1895, with 37·7, a decrease of 4·2. The lowest ratio, 3·9 per 1,000, is shown in the Aden district, which was third lowest the year before with 4·8; the next lowest, 5·0, in the Deesa district, which had the highest admission ratio in 1895, a decrease of 37·3. In addition to those above mentioned, in the Mhow and Bangalore districts the ratios were higher than in the previous year by 16·1 and 15·7 respectively; the largest decrease in ratio, 16·2 and 12·4, being observed in the Meerut and Oudh districts. The highest rate of mortality is observed in the Allahabad district, 17·65 per 1,000, as compared with 4·02 in 1895, the next highest rate, 11·48, being in the Southern district, which stood eighteenth with 3·99 the year before, followed by Sirhind with 10·55, an increase of 4·75. The lowest mortality rate (as in the preceding year) was in the Mandalay district, ·52 per 1,000, a decrease of ·01, and the next lowest, ·89, in the Rangoon district. Among other districts having a higher mortality rate than in the preceding year were Quetta, increased by 6·95, Bangalore by 7·27, Rohilkhand by 2·07, Poona by 2·47, Mhow by 3·80, and Nagpur by 1·63. The largest decrease in the death rate, 7·73, is observed in the Deesa district, which was fourth highest the year before. The Peshawar district, which had the highest ratio in 1895, and Meerut and Bundelkhand, which stood second and third, show death rates diminished by 4·19, 5·42, and 1·16 respectively.

India.

The station at which the greatest number of cases occurred was Quetta, where there were 140 admissions with 22 deaths, as compared with 28 and 6 in 1895. This severe outbreak, for which it is most difficult to account, came on gradually, the first case occurring in April, 3 in May, 29 in June, 24 in July, 33 in August, 18 in September, 25 in October, 6 in November, and one in December. The disease was not confined to any particular corps or barrack, there being in:—

——	Admissions.	Deaths.
No. 2 Mountain Battery, R.A.	13	2
No. 7 Southern Division, R.A.	13	3
No. 28 ,, ,,	12	0
2nd Battalion Lancashire Fusiliers	54	9
2nd ,, Border Regiment	48	8

By ages the admissions were:—

Under 20 years	2
20 to 25 ,,	114
25 to 30 ,,	21
30 to 35 ,,	3

and by length of Indian service:—

Under 1 year	49
1 to 2 years	35
2 to 3 ,,	19
3 to 4 ,,	19
4 to 5 ,,	6
5 to 10 ,,	12

The medical officer states that the most searching inquiries were made with the view of discovering the probable cause of the disease, that the barracks and their surroundings were found to be in a good sanitary condition, the water supply as perfect as it is possible to conceive, being brought in pipes a distance of 13 miles from uninhabited mountains 1,400 feet above the station, and that "any idea that the drinking water could be the cause may be put out of court." He adds that "the most likely cause of all, and the cause to which the disease "has been attributed, is the native city of Quetta. It is full of brothels, "drinking shops, &c., many of which are in a most insanitary condition. "The soldiers frequent these places in great numbers, morning, noon, and "night." He also states that other possible causes of the spread of the disease are (1) smuggling of milk and butter from native villages; (2) native attendants, who are not clean in their person or habits, handling and preparing articles of food, drink, &c.; (3) drinking water from surface irrigating channels of doubtful purity on field days when the drinking water has run out; (4) cases of "ambulant" typhoid sleeping in barracks and fouling the latrines, and (5) flies, which exist in myriads, fouling food, &c. Samples of water from various places and of recently made soda water were bacteriologically examined, and the enteric microbe was discovered in some. The medical officer remarks that "it is strange that in two samples "of water coming from the same source but from different taps, it "should be found in one and not in the other." Two other samples taken from the same tap were examined later and pronounced free from the microbe. The finding of the enteric microbe in samples of soda water was doubtless due to contamination in the process of manufacture, although

India.

every precaution was taken. The medical officer adds that "towards the end " of the year drafts for the different corps arrived from England, and as cases " of enteric fever were admitted from them within a few days of their arrival, " there is no doubt that Quetta is not answerable for these cases," and sums up that he believes "that the disease originated in the city of Quetta, and " that most of the cases were contracted there. It is possible that in some " instances the disease having found its way into barracks may have been " spread by contact by native servants, through the agency of flies, &c., &c." On the 6th June all water vessels were ordered to be washed weekly with a six per cent. solution of permanganate of potash, and the drinking water to be faintly tinged with the same preparation; on the 24th June mussacks and pakhals were ordered to be cleaned with a strong solution of this agent, on the 23rd July all drinking water was ordered to be boiled, and on the 5th August the milk as well.

At Subathu 109 men of the 1st Battalion Black Watch (Royal Highlanders) were admitted and 15 died. In the previous year the 1st Battalion Somersetshire Light Infantry garrisoned Subathu for the second year, and there were 33 admissions with 2 deaths; in 1894 there were 38 admissions and 6 deaths. The Black Watch arrived in India on the 16th February from Mauritius and the Cape, and were encamped at Umballa, reaching Subathu in two parties on the 8th and 24th March respectively, so that all the men admitted had under one year of Indian service. By ages the admissions were :—

20 years and under	15
21 „	20
22 „	16
23 „	21
24 „	14
25 to 29 years	20
30 „ 34 „	3

3 cases occurred in March, 15 in April, 11 in May, 9 in June, 21 in July, 28 in August, 20 in September, and 2 in October; 11 of the cases were admitted from No. 1 Barrack, 8 from No. 2, 15 each from Nos. 3 and 13, 28 from No. 14, 29 from six huts, and 3 from among men occupying tents. No. 15 barrack, occupied by the married soldiers, had no admissions. The medical officer attributes the outbreak to the water from No. 1 spring, situated about 300 yards on the Kasauli road, in which the specific enteric microbe was detected. As soon as the use of the water from this spring was discontinued, new pakhals and mussacks taken into use, all the water boiled, and the bazar put out of bounds, there was marked diminution and final disappearance of the disease. But it is probable that the cases which occurred in March and early in April were imported, as a case occurred at Umballa before the regiment left for Subathu.

At Allahabad enteric fever broke out early in the spring and prevailed in epidemic form in March and April and again in December, making a total for the year of 97 cases with 29 deaths as compared with 29 and 2 in 1895. Four cases occurred in January, 12 in February, 33 in March, 26 in April, 1 in May, 1 in July, 2 in August, 2 in October, 1 in November, and 15 in December. The medical officer states that "the predisposing factors towards this " excessive sickness were without doubt as follows:—(*a*) The unhealthiness " of the year in general from excessive heat and defective rainfall in " the previous year, (*b*) the extreme youth of the regiment affected, " the 1st Battalion Norfolk Regiment, and their very inferior physique " and immaturity in very many instances; (*c*) the fact that the regiment had " very recently arrived in the station from the hills and was serving for the " first time in the plains. To this must be added the fact that the drinking " water obtained from the municipal waterworks was found on bacteriological " examination to be infected to some extent with the enteric microbe; and " here no doubt was the active cause of possibly many of the cases. . . . . " The type of the disease was very severe, and in the majority medical " treatment seemed to be of little, if of any, use. Of the 29 cases which

" ended fatally, 10 came from a freshly landed draft, and in several instances, " although the sufferers were so young, their constitutions had already " been undermined by syphilis, and thus their chances of recovery were " greatly lessened."

At Secunderabad the admissions numbered 96 and the deaths 18, as against 78 and 15 respectively in the previous year. The monthly admissions were:—January, 3; February, 1; March, 9; April, 1; May, 5; June, 2; July, 29; August, 16; September, 8; October, 7; November, 9; December, 6. The admissions occurred chiefly among young men recently arrived in the country, 60 out of the 96 cases being in men between 20 and 24 years of age, with an average Indian service of about 18 months, and principally affected the 1st Battalion Northamptonshire Regiment occupying the 2nd British infantry lines, 51 cases having occurred in that regiment, while in the other infantry battalion there were 21 cases, 15 in the cavalry and 9 in the artillery. The medical officer writes that " in the absence of bacteriological examination it is " impossible to account for this great disparity with any certainty as compared " with the other corps. The drinking water, which is conducted to the lines " occupied by this regiment by means of pipes from a deep covered-in well, " was all boiled without filtration throughout the year. It was, however, discovered that the water was being distributed in mussacks to the barrack-" rooms after having been boiled. This practice was discontinued on the 17th " July, and at the same time orders were issued for all milk to be boiled, " and the purchasing of bazar butter prohibited. A diminution of the number " of cases was observed about three weeks after these precautions had been " adopted, so it would appear that the outbreak might be traced to the use " of infected mussacks, the drinking of impure milk unboiled, or the use of " impure bazar butter. It would be unreasonable in this instance to conclude " that the disease was contracted in the bazars, as it has been proved that the " men of the Northamptonshire Regiment frequent the bazars less than the " men of the other corps in this station."

At Ranikhet there were 75 cases with 11 deaths (the largest number admitted since 1886) as compared with 12 and 3 in 1895. One man was admitted in January, 2 in February, 20 in March, 8 in April, 19 in May, 3 in June, 4 in July, 8 in August, 7 in September, 2 in October, and 1 in November. Of the 75 cases, 45 occurred in the 2nd Battalion Yorkshire Regiment, occupying Koompur Hill Barracks; 23 amongst details occupying the Standing Camp Barracks, and 7 among the married men in the Koompur Half-moon Barracks. By ages the admissions were:—

21 to 24 years	48
25 to 29 „	24
30 years and over	3

and by length of Indian service—

Under 1 year	19
1 to 2 years	14
2 „ 3 „	10
3 „ 4 „	9
4 „ 5 „	7
5 „ 10 „	16

The medical officer remarks that it is difficult to account for the large increase in the admissions for enteric fever, as precautionary measures are steadily being adopted yearly; he believes the treating of drinking water with permanganate of potash, which has been steadily adopted since 1st May, has had a very salutary influence in checking the disease; the enteric microbe has certainly not been detected in the samples of drinking water in which this chemical has been used, nor has the microbe been detected in samples of milk and articles of food, many of which were analysed. The medical officer writes:—" In the admissions for the months of March and April, amounting " to 20 and 8 respectively, there is but little doubt that the disease was " imported into the station, and in the majority of cases it is believed the " disease was contracted either on the railway journey or march up the hill." As regards the large number of cases in the 2nd Battalion Yorkshire Regiment, he remarks that "this regiment only returned from Burma on the 7th March "1896, after 2½ years' residence in that country, and it is probable "that the men indulged freely in drink and visited the bazars and villages "on their journey up country, and that the general health of this battalion "was quite below par on return from an enervating country, and so was "disposed to disease." As regards the other admissions he remarks:—"They "were mostly young soldiers who resorted about the neighbouring villages, "either for shooting, butterfly hunting, &c., and who drank native-supplied "water on their excursions and as much native liquor as they could obtain." He adds as regards the origin of the disease in cantonments, that "all "precautions have been adopted, but when dealing with young soldiers much "difficulty is experienced in trying to get them to follow the most ordinary "rules of hygiene;" and "that the station is generally overcrowded, that its "occupants, as regards British soldiers, are mostly men of enfeebled constitutions "sent for change of climate and prone to disease, and consequently the "per-centage of sickness must carry a higher average in comparison."

India.

At Peshawar there were 72 cases with 17 deaths, as compared with 82 and 28 in 1895. Admissions by months:—January, 5; February, 3; March, 4; April, 5; May, 4; June, 12; July, 17; August, 2; September, *nil*; October, 4; November, 5; and December, 11. By corps:—1st Battalion East Kent Regiment, 36, 1st Devonshire Regiment 28, Royal Artillery 5, Military Prison 2, and 2nd Battalion Argyll and Sutherland Highlanders, who were only for a week in camp at Peshawar, 1. By ages:—20 years and under 6, 21 to 24 years 50, 25 to 30 years 16. By length of Indian service:—Under 1 year 31, 1 to 2 years 13, 2 to 3 years 13, 3 to 4 years 8, 4 to 5 years 4, 5 to 10 years 3. The medical officer remarks that during the first half of the year the type of the disease was severe, the cases commonly developing grave or fatal complications; it became less severe in July and mild later on, ceasing altogether from 4th August to 19th October, there being only one death among the 22 men admitted since July. Special and frequent attention was given throughout the year to the waterworks, kitchens, and conservancy, the bazars and the articles sold there were inspected and examined from time to time, the sanitary surroundings of the waterworks were improved, the storage tanks purified, drinking water boiled and treated with permanganate of potash, kitchens purified, and men of the sweeper caste forbidden therein, conservancy arrangements improved, filth trenches removed to a greater distance, and excreta of enteric cases as well as those of other acute diseases destroyed by fire. It was supposed that the cessation of the disease since the case admitted on the 3rd August was due to the purification of the waterworks and kitchens, but it is recorded that the waterworks were purified with permanganate of potash on the 18th May, and in June and July there were 29 cases, while prior to the month of May there were 17 cases. The medical officer adds that a fresh case occurred on the 20th October, followed by 3 cases from Cherât and 5 en route from Bombay, and after a short interval of 18 days "fresh cases, apparently of local origin, began to "occur; these have been attributed to eating watercresses grown in water "liable to pollution." The selling of cresses in barracks was consequently prohibited, and the men warned of the danger of partaking of uncooked vegetables. Exposure to the sun, especially on the rifle ranges, the medical officer states, has sometimes seemed to act as an exciting cause. The men are required to fill their water-bottles with boiled and purified water from barracks when going to the rifle ranges.

At Mhow the cases numbered 70 and the deaths 9 as compared with 32 and 7 in 1895. The medical officer writes:—"The disease ran through last cold "season (1895–96) only ceasing at the end of February. March was free, "but it began again early in April, but ceased at the end of the month, "during which time there were 14 cases. May, again, was free, and the "greater part of June, but another outbreak occurred about the third week "of June and continued throughout the rains, gradually declining towards "the cold weather. There was, however, a recrudescence in December, when "13 cases occurred. . . . . There were 3 cases among the officers, and "5 women and 1 child contracted the disease, which is very unusual at "Mhow. There was a case at the end of last year among the women of the "Hussars who had just arrived from England, and that was about the first

India.

"on record." The following table shows the admissions by corps and months:—

Corps.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total. Admissions.	Total. Deaths.
"I" Battery, R.H.A.	—	—	—	1	—	—	3	1	1	—	—	—	6	1
20th Hussars	1	1	—	4	—	3	4	6	2	2	1	6	30	3
22nd Field Battery, R.A.	—	—	—	—	—	—	—	—	—	—	—	1	1	—
1st Battalion Royal Fusiliers	—	2	—	9	—	—	4	4	2	1	1	6	29	4
2nd Battalion Durham Light Infantry	3	1	—	—	—	—	—	—	—	—	—	—	4	1
Total	4	4	—	14	—	3	11	11	5	3	2	13	70	9

It will be observed that the 22nd Field Battery Royal Artillery, which arrived from Nasirabad and camp of exercise in February, escaped almost altogether, a circumstance difficult to explain, as the men used the same water and milk as the rest of the garrison. The medical officer states that the water supply for the garrison, which is brought into the station in 10-inch pipes from the Bircha lake, 5 miles south of Mhow, without passing through any filter beds, and stored in a large open reservoir at the highest part of the cantonment and in a small cistern on the top of one of the European infantry barracks, is insufficiently protected against pollution. The water is very muddy during the rains, contains a large quantity of vegetable *débris*, and is quite undrinkable without sedimentation by alum or filtration. The natives use well water in preference for drinking and culinary purposes. He adds: "I feel certain we shall never reduce the number of enteric cases, however, "to what it was before the introduction of the Bircha supply without filter "beds," and "that Bircha water is responsible for the prevalence of enteric "fever at Mhow in such increased numbers cannot be gainsaid, ... "The enteric bacillus was found in all the tap samples sent for analysis, and "also in the water taken direct from Bircha lake itself during several "months, but it was absent from samples of well water taken from the "bazar."

At Meerut there were 67 admissions with 15 deaths, including 4 from amongst those remaining from the previous year, as compared with 94 and 26 in 1895, and 78 and 27 in 1894. Monthly the admissions were in January, 9; February, 4; March, 2; April, 4; May, 8; June, 3; July, 4; August, 1; September, 6; October, 2; November, 5; and December, 19. The medical officer writes:—"Amongst the non-commissioned officers and men there is "little difference, allowing for strength of corps, in the incidence of the "disease on the three arms—cavalry, artillery, and infantry. This year "January and December were the most unhealthy, the intervening months "showing a very considerable reduction in number of cases, especially "April, May, and June, in contrast with the same period of 1895. During "the month of December the several batteries which had been clear of the "disease during the year, except 'N' Royal Horse Artillery, which had "1 admission in March and 3 in May, suddenly developed the disease, "giving 10 out of the 19 admissions for that month. The water supply and "milk from the dairy were at once examined chemically and bacteriologically, as "were the surroundings, and media for drawing and conveying such, but no "cause could be found. . . . . The cause of the disease has been most "difficult to trace, and in not one single case can it be positively said that "the origin has been discovered; the sources from which some of the men "were said to have drunk water were very suspicious. There is no doubt but "that the bazars are to blame in many instances; men frequent such in large "numbers, and drink and eat all sorts of refreshments in the many coffee "shops which are there, and also frequent chuklas (brothels), as the venereal

"admissions show, and it was found on an examination of some of the water, *India.*
"as well as aërated waters manufactured in the bazar, and which were "supplied to the Good Templars' Hall as well as to a 'chukla,' much visited "by the men, that the enteric microbe existed therein, and the fact that the "married families were free from the disease increases one's suspicion about "the bazar. The question of the constant existence of enteric fever in Meerut "is a difficult one to answer. The disease is not confined to one corps in "particular, but found amongst all; it has its seasons of activity, and "notwithstanding the boiling of water and disinfection by permanganate of "potash, I am of opinion that until the whole system of the water supply is "altered, pumps erected, and there is a direct delivery to all quarters without "the intervention of bhistis, with their mussacks and buckets, we shall "never wholly eradicate the disease, though with all the precautions as to "cleanliness and disinfection now taken, we may lessen such."

Lucknow had 57 admissions with 21 deaths as against 128 with 35, the largest number at any station, in 1895. By months the admissions were:—In January, 2; February, *nil;* March, 5; April, 15; May, 5; June, 4; July, *nil;* August, 5; September, 3; October, 3; November, 3; and December, 12. By ages:—Under 20 years 2, from 20 to 24 years 39, from 25 to 29 years 16. By length of Indian service:—Under 1 year 25, from 1 to 2 years 13, from 2 to 3 years 4, from 3 to 4 years 11, from 4 to 5 years 3, and from 5 to 10 years 1. The medical officer remarks that enteric fever continued, as in former years, to be the chief cause of mortality; that mortality of over 36 per cent. of the admissions in a station hospital with skilled attendance can only be accounted for by attributing it to the virulence of the disease, and "nothing has been more disappointing than the sudden occurrence of heart "failure in cases which appeared to be doing well." "In many cases the "fatal issue did not appear to be justified by the height or duration of the "temperature, the presence of diarrhœa, or the nature of the lesions found "at the post-mortem, and seemed to be directly due to the systemic effects "of a toxine." The medical officer does not think the history of the cases of enteric fever in Lucknow during the year under report has thrown much light on the etiology of the disease. In two cases the disease was probably contracted elsewhere, as the men had arrived from Fyzabad and Mhow a week before admission, one probably contracted the disease in the hospital wards, as he was the non-commissioned officer of the nursing orderlies, some probably in the bazars, from the fact that one of the two infantry battalions (the 1st Battalion Duke of Cornwall's Light Infantry), which suffered most from enteric fever, is the one which has the highest per-centage of admissions for venereal diseases, thus lending colour to the assumption that where the men contracted the one they contracted the other, although, it should be stated, careful investigation into each case failed to substantiate this opinion; four cases originated in hospital, three of the men being under treatment for primary syphilis and one for ulcer of leg; in two of these cases the disease was changed to enteric after 15 and 18 days respectively. On the 25th April the bacteriologist reported the presence of the enteric microbe in the cistern of the cook-house of a company of infantry from which a man was admitted; there were no other cases at the time from that company; the microbe was also found in water (melted ice) taken from the hospital ice-box. The cisterns were then cleansed with permanganate of potash, and the systematic pinking of drinking water in barracks commenced. In the month of May the bacteriologist reported that the enteric microbe was present in the earthen water goblet used by a man of the 16th Lancers, admitted for enteric fever, but he failed to find it in others believed to be used by men admitted for the disease from other corps. The rapid decline in the number of admissions which followed the general adoption of pinking water in barracks in the month of May was thought to be due to the use of the permanganate of potash, but the statistics of 1894 and 1895 show a similar diminution during the months of June and July in those years. In September the bacteriologist reported that he detected the enteric microbe in samples of water sent him from the Lucknow waterworks, and in October, in four out of six samples taken from different standposts in cantonments, but not in specimens taken from the same source in December; he, however, detected it in the municipal water supply in January 1897. The following are the concluding

India.

remarks of the medical officer as to the causation of the disease:—"Assuming " that the enteric microbe was present in the cantonment mains during " September and October, and, as the evidence showed, was widely diffused, there " was no corresponding increase, but rather a marked diminution in the number " of cases as compared with the earlier months of the year. Supposing that, " as far as the troops were concerned, the pinking of the water acted as a " protection, yet this will not account for the absence of enteric fever in the " cantonment generally, where a large European population draw their water " supply direct from the standposts. Amongst the officers and their families " there were only two cases of enteric fever between January and December " in Lucknow, and in both of these the disease was certainly contracted " outside the station. From the above data one of two conclusions seems " inevitable, either that the microbe found was not the special cause of enteric " fever or that the microbe can be consumed with impunity by all but a very " small per-centage of people. It seems very questionable whether the " microbe Mr. Hankin found was not generally present in the cantonment " water supply throughout the year, and, if so, the presence of enteric fever " amongst the troops is fully explained."

At Benares there were 54 cases with 9 deaths, as compared with 43 and 2 in 1895. Enteric fever was prevalent almost throughout the year, but most so in April and August. No case occurred in either January or February; March gave 4 admissions; April, 17; May, 2; June, 3; July, 3; August, 11; September, 5; October, 2; November, 3; and December, 4. It prevailed mostly among the young soldiers from 20 to 22 years of age, and the majority of cases were of a very severe type. The medical officer states that "during January, February, " and the greater part of March the water used was from the wells in the " cantonment. There were during that period no enteric fever cases. On the " removal of the wing into sanitary camps (owing to an outbreak of cholera in " March) the water was carefully boiled. Enteric from that time became " nearly epidemic. On their return the water was obtained from the " municipal waterworks, and was also boiled without affecting the prevalence " of enteric in the least. Permanganate of potassium was used for a time, " but given up as the men did not care for the water so treated, and because " the water was reported as being, from a bacteriological point of view, pure."

At Agra there were 50 admissions for enteric fever and 14 deaths. The number admitted is greater than last year, 38, and more nearly approximates to 1894, in which year there were 45 cases. The number of deaths was, however, less than in 1895 by 4, though not so low as 7 in 1894. By months the admissions were:—January, 1; February, 3; March, 2; April, 2; May, 3; June, *nil*; July, 1; August, 11; September, 16; October, 5; November, 4; and December, 2. By ages:—Under 20 years 1, 20 to 24 years 41, 25 to 29 years 6, 30 to 34 years 2. By length of Indian service:—Under one year 10, 1 to 2 years 13, 2 to 3 years 11, 3 to 4 years 6, 4 to 5 years 4, 5 to 10 years 4, and over 10 years 2. The medical officer writes (26th January 1897):—"The " treatment of the drinking and other water with permanganate of potassium " was commenced in February and carried out very stringently, especially so " in the East Surrey Regiment, as the men believed in it thoroughly. At first " it worked like a charm as the cases decreased, and May, June, and July " were practically free from the scourge, a case admitted on the 28th July " being the only one recorded. August remained almost free, but a case " occurred on the 21st, then the outbreak commenced, and cases came in " rapidly. Every imaginable source of infection was examined, food, drink, " and supplies of all kinds, the soil in which vegetables were grown, the " water in which they had been washed, &c., were all bacteriologically " examined by the kindness of Professor Hankin, but in none of these was the " enteric microbe found except in the water supplied to cantonments by the " municipality. The microbe was found at this time in every specimen " examined. Not one, but many specimens were sent to the laboratory for this " purpose. The microbe was also found in a flourishing condition in the pink " water in the receptacles used for holding the drinking water both in hospital " and barracks, although every care was taken and the permanganate solution " introduced at night so as to ensure its producing the necessary effect. This " was a great disappointment to me, as I was beginning to think that a " panacea had been found for this scourge. The situation was now desperate,

India.

“ so, after consultation with Professor Hankin, we commenced making “ experiments with micrococcus ghadiallii,[*] found by him to be antagonistic “ to the enteric microbe. This micrococcus is quite harmless to human “ beings, so I had no hesitation in trying it as the enteric cases were increasing “ daily. It was first tried in the swimming bath at the Fort, which was “ found to be infected with the enteric microbe. In four days there were none. “ About the same time it was taken into use in the Agra Club, then the water “ supply at the Fort was treated, with an almost immediate cessation of cases, “ and lastly the water of the whole cantonment, and the disease at once “ began to ameliorate in a very marked manner. From the time the water “ supply was treated with the micrococcus the number of admissions fell “ rapidly. I have not been able to follow out the research desirable in this “ line as Professor Hankin has left the station for the purpose of investigating “ the plague at Bombay, and I am thus deprived of his assistance. The “ matter is, I think, well worth further investigation. No section of the “ garrison escaped, every corps supplying its victims; several children had the “ disease, but no women. . . . . . but though greatly disappointed at “ the failure of the permanganate treatment of water, I have really some hopes “ from the treatment with the micrococcus ghadiallii. . . . . I must add “ to my remarks regarding the micrococcus treatment, however, that the “ drinking water was boiled and is still being boiled. There is also another “ interesting fact in the same connexion; the excreta of one or two patients “ was examined prior to treatment, and the enteric microbe was found in “ abundance; after two or three days' treatment the excreta were again “ examined, and the microbe was absent.”

The admissions at Umballa were 49, excluding 3 transfers during the year, and the deaths 14, including a man admitted in 1895. The year before there were 86 admissions with 17 deaths. The admissions were by months:—January, 4; February, 1; March, 4; April, 3; May, *nil;* June, 2; July, 1; August, 2; September, 3; October, 3; November, 9; and December, 17. Admissions by periods of Indian service:—Under 1 year 30, 1 to 2 years 8, 2 to 3 years 4, 3 to 4 years 3, 4 to 5 years 1, and 5 to 10 years 3. Admissions by ages:—Under 20 years 3, 20 to 24 years 33, 25 to 29 years 10, and 30 to 34 years 3. The medical officer attributes the decrease principally to the boiling of drinking water, and remarks:—“Although the fact that over half the admissions “ occurred in November and December might seem to show that the previous “ decrease was due to other causes, I am inclined to think that in some “ unexplained manner the disease accompanied the Royal West Surrey and “ Black Watch, the former regiment reaching Umballa (from Dagshai) on the “ 6th November, and the Black Watch (from Subathu) on the 21st October.” Both these regiments had suffered greatly from enteric while in the hills.

At Bangalore the cases numbered 47 and the deaths 16, a considerable increase on the numbers during 1895, which were 18 and 2. The admissions by months were:—January, *nil;* February, 2; March, 9; April, 8; May, 2; June, 5; July, 8; August, 3; September, *nil;* October, 1; November, 1; and December, 8. There were 16 admissions in the cavalry, 13 in the artillery, 17 in the infantry, and 1 in the military prison. By ages the admissions were:—Under 20 years 1, 20 to 24 years 36, 25 to 29 years 8, 30 to 34 years 1, and 35 to 39 years 1. By length of Indian Service:—Under 1 year 9, 1 to 2 years 6, 2 to 3 years 15, 3 to 4 years 5, 4 to 5 years 3, and 5 to 10 years 5. The medical officer states that “the source of infection, or even the suspicion of the probable origin, was “ not in a single instance evident after the most careful investigation. The “ possible sources of origin are so numerous in this country that it is “ generally impossible to trace them. Youth and short residence in the “ country appear to render men more liable to attack.”

At Bareilly the cases numbered 46 and the deaths 13, as compared with 52 and 6 in 1895. Admissions by months:—January, 5; February, 6; March, 4; April, 7; May, *nil;* June, 4; July, 6; August, 4; September, 2; October, 1; November, 5, and December, 2. The medical officer remarks that “ the “ proximity of the native city of Bareilly to cantonments must always be a

---

[†] The micrococcus was discovered by and named after Dr. Ghadially, a native assistant in Professor Hankin's laboratory at Agra (*see* Annual Report of Chemical Analyst and Bacteriologist to the Government of the North-West Provinces and Oudh for 1896).

India.

" source of the disease as the men have free access to it. In the city are " some forty places where aërated and other drinks are sold. As far as can " be ascertained the water used in the manufacture of these drinks has never " been examined chemically or bacteriologically. Of the 46 men admitted " no less than 30 belonged to the Army Temperance Association." The water supply is from covered wells and protected from surface washings; the samples of water analysed before and after the rains gave satisfactory results and the enteric microbe was not found in any of them. The water is raised by chain pumps, and is stored in galvanised iron tanks and distributed to barracks and cook-houses in kerosine tins. Of the 46 admissions 35 were from barracks and 11 from camps; 5 of the 13 deaths were admissions during 1895.

At Dagshai there were 41 cases with 11 deaths, as compared with 22 and 2 during the previous year. 3 men were under 20 years of age, 29 from 20 to 24 years, and 9 from 25 to 30 years. 11 men had less than one year, 28 had one year, 1 two years, and 1 three years of service in India. By months the admissions were:—April, 3; May, 1; June, 6; July, 16; August, 10; September, 4; and October, 1. 3 cases were admitted from No. 1 barrack, 6 from No. 2, 9 from No. 7, 2 from No. 8, 7 from No. 9, 4 from No. 10, 2 each from Nos. 11, 12, and 22, 3 from 24, and one from 25. The medical officer states that the first case was admitted into hospital on 6th April and the last on 17th October, and that the enteric microbe was detected in the water of the cook-house tub of No. 7 barrack, and in the water tank of No. 8 barrack on the 16th July, and that "a specimen of water was " sent from the large drinking water tank at the same time, and analysis " proved the pure water supply to be adulterated at its source. Arrangements " were at once made that none of this water should be drunk except after " treatment with permanganate of potassium; all mussacks used for carrying " drinking water were disinfected once a month with quicklime, and subse- " quently, in addition to these precautions, all drinking water was boiled " previously to being treated with permanaganate of potassium. There was " no diminution in enteric admissions after the use of permanganate, " but an increase; there were 18 cases with 6 deaths before its use, and 23 with " 5 deaths after its use, so that the mortality was less, but from the evidence " before me I am not prepared to give any opinion as to the value of this " prophylactic. The last two admissions were total abstainers and appear to " have drunk the pink water, boiled freely, with an excellent faith. As they were " admitted on the 30th September and 17th October respectively, it cannot " be contended in their cases that the period of incubation preceded the " special precautions taken. These two men declared that they never ate or " drank outside the barracks; they both occupied the same barrack room. . . " The history of the 1896 epidemic of enteric fever may be briefly sum- " marised. In April the introduction of men occurred who already had " taken in the enteric microbe on the march from Umballa, so probably when " suffering from the disease they contaminated the water supply, as at present " our water at Dagshai is from three or four springs in the two hills immedi- " ately under our barracks, so that it does not appear at all unreasonable, with a " geological formation such as we have at Dagshai, to assume that there are " channels from the surface of the ground with its many deep fissures, com- " municating direct with the streams; indeed this is the only way the water " supply at its source could be contaminated directly by human beings. I " consider the Dagshai epidemic of 1896 was water-borne, and the water to " have been contaminated by the enteric microbe introduced from the plains " or road between the plains and Dagshai."

At Kirkee there were 40 cases with 17 deaths (including a man admitted in 1895) as compared with 22 and 5 in the previous year. By months the admissions were:—March, 4; April, 5; May, 10; June, 3; July, 4; August, 7; September, 2; October, 4; and November, 1. In "L" Battery, R.H.A., there were three cases, all among men of over three years Indian service; in the 1st Field Battery, Royal Artillery, 17 cases, and in the 16th Field Battery 11 cases, all among men who had arrived in the country during the year; the 72nd Field Battery had 6 cases, only one of whom had less than a year's service in India, and the detachment of infantry had 3 cases, one man having arrived in India during the year. The medical officer states that in no case could the source of the disease be traced, that the water was pure, though muddy in the monsoon, and was boiled for drinking purposes, permanganate of potash and alum being used as required; that the milk, food and water supplied to the men in barracks were good, and, as far as could be judged, free from defect, and that the sanitary condition of the barracks was quite satisfactory. He adds:—"It is the surrounding villages and the bazars which may be "visited by soldiers that very likely account for the source of the infection." *India.*

At Fyzabad there were 39 cases with 13 deaths; in the previous year 16 men were admitted and all recovered. Admissions by months were:—January, 3; February, 1; March, 3; April, *nil;* May, 6; June, *nil;* July, 1; August, 10; September, 1; October, 3; November, 9; and December, 2. The 30th Field Battery, Royal Artillery, had 2 cases, the 39th Field Battery 3 cases, and the 2nd Battalion Royal Sussex Regiment 34 cases. No cause could be ascertained in any of the cases, and the admissions were fairly evenly distributed from all the barracks. The medical officer remarks that after permanganate of potash begun to be added to the drinking water one case occurred in July. "Although it has been added with scrupulous care ever since, cases "have been occurring since. The greatest care has been exercised both with "regard to the milk supply and the management and cleanliness of the cook-"houses, especially in the Royal Sussex Regiment, where the commanding "officer has exercised the most careful personal supervision in these matters. "All the cases were contracted in the station, except two, who contracted it "on the journey from Bombay."

At Rawal Pindi 36 men were admitted and 15 died; the numbers in 1895 were 64 and 24. By months the admissions were:—January, 1; February, 1; March, *nil;* April, 7; May, 9; June, 4; July, 1; August, 2; September, 4; October, 3; November, 1; and December 3. The 4th Dragoon Guards had 20 cases, the artillery 4, and the infantry 12. The medical officer remarks that the large number of cases in the cavalry may possibly be attributed to their having arrived in the country more recently than the other corps, that the disease was of a severe type, and that the intense heat during the month of May is accountable to a certain extent for the large per-centage of deaths. He adds that the cause of the disease cannot be traced, but no doubt the bazars must be looked upon as a source of infection, though the strictest sanitary arrangements were in force under efficient supervision; and that the instructions regarding the use of permanganate of potash in drinking water, &c., were carefully carried out by all the corps with seemingly satisfactory results. The water supply is from the same source as last year, and the same precautions exist.

At Mian Mir the cases numbered 36 and the deaths 4. In 1895 the numbers were 14 and 4 respectively. By months and corps the admissions were:—January, 4; February, 3; and March, 4; all in the Somersetshire Light Infantry; April, 3, 1 in 9th Field Battery and 2 in Somersetshire Light Infantry; May, 7, 1 in 9th Field Battery and 6 in Somersetshire Light Infantry; June, *nil;* July, 5; 1 in 31st Field Battery and 4 in Somersetshire Light Infantry; August and September, *nil*, October, 2, one each in 31st Field Battery and Somersetshire Light Infantry; November 4, 2 each in 31st Field Battery and Somersetshire Light Infantry; December, 4, 1 in 31st Field Battery and 3 in Somersetshire Light Infantry. Admissions by ages:—28 among men from 20 to 24 years of age, 7 from 25 to 29 years, and one from 30 to 34 years. By length of Indian service:—Under 1 year 5, from 1 to 2 years 2, from 2 to 3 years 20, from 3 to 4 years 7, from 5 to 10 years 2. The medical officer remarks that the troops were apparently living under similar conditions of climate, drainage, accommodation, water supply, cooking arrangements and conservancy, yet there is a considerable difference in the degree in which the different corps suffered. As the artillery and infantry lines are three miles apart it is evident the cause, whatever it may be, existed at both ends of the station. The medical officer thinks that the disease was probably contracted in the bazars from the fact that the Somersetshire Light Infantry had an admission ratio of 360·7 per 1,000 for primary venereal diseases, the 31st Field Battery, Royal Artillery, had 336·1, and the 9th Field Battery 277·8, which corresponds with the order of relative frequency of enteric fever amongst these corps, namely, 46·7, 41·0, and 15·9 respectively, and that no officer and none of the women and children suffered from the disease.

India.

At Poona 35 men were admitted and 12 died. The numbers in the previous year were 47 and 13. Monthly the admissions were:—In January, 1; February, *nil;* March, 4; April, 1; May, *nil;* June, 1; July, 4; August, 15; September, 5; October, 3; November, *nil;* and December, 1. In 1895 the largest number of cases (11) also occurred in August. The medical officer remarks that the reduction in the number of cases may in a measure be due to extra care taken concerning the water supply, since the month of May the water having been either boiled or treated with permanganate of potash.

At Nasirabad 29 men were admitted and 12 died, as compared with 21 admissions and 7 deaths in the year before. The cases occurred in January, 1; March, 1; April, 8; May, 7; June, 1; August, 4; September, 5; October and December, 1; February, July and November being free. 24 cases occurred in the infantry, and 5 in the artillery. The drinking water, obtained from the Dilwara well, 2 miles north-east of barracks, is brought in casks and recently in galvanised iron tanks, and drawn into galvanised iron buckets, boiled, cooled, treated with permanganate of potash and stored in filter cases, afterwards being drawn into surahis, which are on stands in the barrack-rooms, and great care taken to keep these clean. Analysis of this water made from time to time showed it to be a good, wholesome drinking water free from enteric microbe. For ablution purposes water is obtained from Danta wells, 5 miles distant; it is brought in pipes to a large reservoir and then distributed by stand-pipes throughout barracks, cantonment, and bazar; the quality of this water is not very good, and the enteric microbe has been frequently discovered in it, and on every stand-pipe a notice is posted that it is "not for drinking." Both the Dilwara and Danta wells and reservoir are regularly treated once a week with permanganate of potash. The medical officer remarks that the cases (9) from Nos. 1 and 2 infantry barracks may be accounted for as the rooms have not sufficient through ventilation, the floors are in a bad state, and the subsoil is apparently saturated with the accumulation of years. The cause of the other cases is attributed to the men drinking the prohibited Danta well water and possibly to their visiting the bazars, as on several occasions men have been admitted for venereal sores, and within a week have shown signs of enteric. All water and milk intended for use is boiled, and the latter, from the cantonment dairy only, which is above suspicion, is allowed to be sold in barracks. Enteric fever has been most prevalent when there were hot dry winds and much dust.

At Jhansi there were 28 cases with 8 deaths, as compared with 32 and 8 in 1895. The medical officer remarks:—"More than a third of the cases "occurred in November after the arrival in the station of the 80th Field "Battery, Royal Artillery, from England, and the 1st Battalion East Surrey Regiment from Agra. It is probable that with two or three exceptions the disease in all cases was contracted in the station. In ten the first "symptoms appeared whilst the patients were under treatment in hospital "for some other disease, in seven of them the disease being venereal. "Sixteen of the patients were under one year's service in India, nine "of these being under six months' service in the country, and 24 of "them were under 25 years of age. . . . The disease was rather "more prevalent amongst the artillery than the infantry, but this "is accounted for by the arrival of the 80th Field Battery direct from "England. I have been quite unable to trace the origin of the disease to "any special source, or, excepting length of service in India and age, to connect it with any common condition, such as occupation of the same "barrack room, source of or purity of water, milk, or food supply. The "water is abundant and chemically pure, and on July 25th filtration was "discontinued, and permanganate of potash was added to all drinking water "as directed by Mr. Hankin. Since October 24th the additional precaution "of allowing the water to stand for 12 hours after the permanganate had "been added to it was also adopted. So far as I am able to judge, this "treatment of the drinking water has had no effect in reducing the number "of admissions for the disease."

At Jubbulpore enteric fever furnished 28 cases, being 11 more than in 1895; 5 occurred in the Royal Artillery and 23 in the infantry. There were 3 deaths, 2 in the infantry and 1 in the artillery, against 5 in the previous year. The fever appeared in the beginning of March, when 2 cases occurred after an interval of some months, and prevailed to a considerable extent in April and May, there having been 12 and 7 admissions respectively during these months; in June 1 case occurred, in July 2, in August and September 1 each, and in December 2. The water supply is obtained by pipe from the municipal waterworks; the water is rain water collected in a large reservoir and distributed without filtration; it is open to contamination, as the enteric microbe, as well as the cholera microbe in an undeveloped stage, was found in samples of water both from stand-pipes and reservoir during the early part of the year when enteric fever was prevailing. On boiling the water, besides treating it with permanganate of potash in the month of May, the cases lessened. The isolated cases which occurred since were apparently due to some extraneous source. *India.*

At Barrackpore there were 25 admissions with 2 deaths, as against one admission in 1895. The first case, which is not recorded in the statistics of the station, was that of a man who was confined in the Artillery guard-room for 8 days previous to being sent to the Military Prison in Fort William on the 10th March, and admitted into the Calcutta station hospital on the 14th March; 2 other cases occurred in the same month; in April there were 4 admissions; in May, 3; June, 5; July, 4; August, 4; September, 2; and November, 1. In the 41st Field Battery, Royal Artillery, recently arrived from England, 15 cases occurred; in the 13th Company, Eastern Division, Royal Artillery 5, and in the detachment of infantry 5. No definite cause for the outbreak could be discovered, but the medical officer suspected (1) milk contamination, as the arrangements for the milk supply were completely neglected, and (2) drinking in the bazars. The water supply was twice examined and reported free from enteric microbe. With regard to the use of permanganate of potash, the medical officer remarks:—"The period during which permanganated water "for drinking purposes was used in the 41st Field Battery, was 8 days, viz., "from 8th to 15th June. On the latter date Mr. Hankin's report on the "absence of the enteric microbe from the water, and his further recommen-"dations regarding the use of permanganated water for washing kitchen and "table utensils, rendered a change necessary, but in the case of the 13th "Company, Eastern Division, Royal Artillery, the drinking water was per-"manganated from the 28th April, although the water-bottles were not filled "with the coloured water till the 8th June. If we take the case of the 13th "Company, Eastern Division, Royal Artillery, in which corps alone the "permanganate method was experimentally but (since water-bottles were not "treated) imperfectly tried, we have the following result:—Water permanga-"nated 28th April.—One case occurred on the 27th May, and one on 11th "June. While during the same period the 41st Field Battery using ordinary "water contributed one case on 18th May, one on 31st May, and the Munster "Fusiliers, also using ordinary water, gave one case on the 4th June. Thus a "comparison of the cases of corps under these opposite conditions gave results "not encouragingly favourable to the permanganate process."

At Cawnpore the cases numbered 20 and the deaths 5. In 1895 the numbers were 16 and 5 respectively. The admissions according to months were: January, 3; February, 4; March, 2; April, 2; May, 1; July, 1; August, 2; September, 1; November, 1; and December, 3. The medical officer remarks that the largest number of admissions occurred during the cold weather, when men are taken outside the limits of barracks; that the small number for the month of May is unusual, and that no single case could be traced to any definite cause, except in the case of a man who had been shooting near Jhansi and who stated he had lived on milk from villages and drank water from a tank. He adds: "Within the lines there is no insanitary influences which could cause "the disease. Most men admitted for enteric fever show previous admissions "for venereal disease, and it is just as likely that when they contracted one "disease they contracted the other." As usual the young soldiers and recent arrivals suffered most. As regards the use of permanganate of potash, the medical officer states that it was added to the drinking water from the beginning of May to the middle of August and then put into the wells used for drinking purposes, as the men evaded drinking "pink water" otherwise, and that the number of admissions during the period from May to December shows a decline of only 3 cases as compared with the previous year.

India.

At Nowshera there were 20 admissions (excluding one man transferred from Cherat) with 4 deaths. In 1895 the numbers were 10 and 1 respectively. Of the 20 admissions, 2 were admitted on the day of arrival of the men from Cherat and Murree, 2 in April, 5 in May, 8 in June, 2 in August, and 1 in October. From 1st January to 30th June the water was boiled, and during this period there were 15 admissions. The cisterns used for drinking water were treated with permanganate of potash from 1st June to 15th September, and the wells from 25th to 29th July and again in September, and during this period 10 cases occurred. During the month of June, when the water was both boiled and treated with permanganate of potash, there were 8 admissions, the highest of any month in the year. From 15th September to 12th December the water was neither boiled nor treated with potash, and only one case of local origin occurred during this period. No definite cause could be ascertained.

At no other stations than those specially noted above did the number of cases exceed 20. Taking next a few stations which show an appreciable diminution of enteric fever as compared with the previous year, it is observed that:—

At Chaubuttia in 1895 there were 16 admissions with 4 deaths, while in the year under report only one case occurred, and that of a mild type, probably contracted out of the station, as the patient was in the habit of taking long walks about the neighbouring hills and drinking water whenever he found any. This improvement is no doubt due to the precautions taken as regards the water supply, which the medical officer states is obtained from the "Forest Spring," about 1½ miles from cantonments and well away from habitations and cultivated ground. This water is used for all purposes, is carried and distributed throughout barracks in pakhals which are regularly and thoroughly cleaned with a solution of permanganate of potash in the presence of an assistant surgeon in the station hospital, and European supervision generally has been adopted with reference to every detail connected with the water supply. The medical officer adds that the greatest care has also been exercised with reference to the sanitary arrangements in barracks and hospitals. All vessels,—mussacks, pakhals, &c.,—for carrying water, all receptacles for storing, &c., have been periodically inspected and cleaned with permanganate of potash solution, and latterly all water has been similarly treated. All milk has been obtained from cows kept in the station under proper supervision; the cows are milked daily near the regimental ration stand, the milk at once boiled in the Regimental Institute and then issued under regimental arrangements to men in barracks and to families. The butter has been made in the hospital from milk obtained at Ranikhet and then taken to the Regimental Institute for distribution; all other supplies are obtained from the same source. Careful attention has been paid to the cook-houses, the floors cleaned with permanganate of potash solution, the tanks similarly treated, the cooks and their assistants obliged to attend to their personal cleanliness and supplied with clean dusters in sufficient numbers.

At Shahjahanpur one man was admitted, while in 1895 there were 14 admissions with 4 deaths. The patient arrived at the station on 27th February, felt unwell for two or three days, and was admitted on the 6th March; it is therefore evident the disease was not contracted at the station. The medical officer believes the absence of enteric fever was due to the improved milk and butter supply and general attention to sanitary details, rather than to the addition of permanganate of potash to the wells, as none was added in the early part of the year. The milk and butter are obtained from a dairy connected with a missionary establishment situated about two miles from cantonment. No natives are allowed to sell any milk in barracks.

At Roorkee 3 admissions to hospital and 2 transfers from Camp Pur make up the enteric record for 1896, as against 9 admissions with 2 deaths in 1895. The medical officer states that of the 2 transfers, one almost certainly and the other possibly, contracted the disease before leaving Bareilly. Of the 3 admissions, one was admitted the day after arrival from Camp Pur, where it is evident the disease was contracted; the second had arrived from Kailana on the preceding day, the man stating that he had travelled direct and had suffered from feverishness and headache before leaving that station; the third

India.

was a young soldier who landed in India on 29th October, reached Roorkee on 8th November, and was admitted to hospital on 4th December, the rose spots appearing on the 8th December; he was ill for about 9 days before going to hospital. In this case it cannot be definitely said whether the disease was contracted at Roorkee or before arrival at the station. With this possible exception no case of enteric fever originated in Roorkee during 1896, a freedom from the almost universal occurrence of the disease that had not been enjoyed for at least 13 years previously. There is therefore no prevalence of enteric fever to be explained. As to the possible reasons for its absence, and the sanitary measures adopted for the prevention of disease, the medical officer states:—" For the prevention of cholera and enteric fever probably the " same measures suffice. These have been directed at this station to the " following possible modes of entry of the disease-poison:—Drinking water, " mineral waters, milk, fruit and vegetables, condition of cook-houses and " latrines." At the beginning of the year all drinking water was boiled before being passed through the Macnamara filter; the sand washed and boiled and the animal charcoal roasted every two months instead of every six months; the sand and broken bricks for the filter tank well were also boiled before charging the filter, and the water for breadmaking boiled as well. From the 12th May all filters were treated weekly with permanganate of potash solution, also all vessels for keeping drinking water, such as cook-house tanks, surahies, &c., were daily emptied out and cleaned weekly with permanganate solution. On the 31st May the Macnamara filters were withdrawn, but the boiling of water and the use of permanganate were continued. On the 8th August, in consequence of the occurrence of a case of cholera in the city, the rules of Mr. Hankin (the Provincial Government Chemical Examiner and Bacteriologist) for the thorough treatment of all drinking water with permanganate of potash were adopted and continued to the end of the year. The same precautions are taken for mineral waters as for drinking water. Until the end of May the water was boiled and filtered, since then it has been boiled only; the factory is under regimental supervision although owned by a native. The regimental dairy, which supplies the garrison with milk and butter, is managed regimentally and kept in excellent order. The cows, although the property of a native contractor, are fed, watered, and housed within lines; they are milked under the supervision of the dairyman, and the milk before being issued is boiled. The milk used for making butter is not boiled, but it is hoped before long arrangements will be made to effectually destroy any disease germs possibly present in the milk without actually raising it to boiling temperature and so diminishing the yield of butter. All fruit and vegetables sold in the lines were daily brought to the station hospital for inspection, care was taken not to pass any unsound or unripe fruit; when cholera threatened all vegetables were cooked. Especial care was taken to keep the cook-houses clean, keeping out flies, keeping all articles of food inside wire safes, boiling dusters, and taking care that a latrine sweeper did not enter a cook-house. In the Royal Artillery lines the cook-houses and latrines are objectionably near each other, hence the necessity of greater care to keep the former free from contamination, and the latter as clean as possible. In conclusion the medical officer states:—" The " regimental authorities have always been most willing and prompt in carry- " ing out the suggestions offered. I think to this, and to the generally " greater watchfulness and care for health matters shown by both officers and " men, must be attributed, (at any rate in part), the freedom from infectious " diseases (one group only excepted) that has been enjoyed during the past " year."

As an illustration of impure water being the cause of enteric fever, the occurrence of 13 cases with five deaths at Cannanore during the year under report is noticed. The medical officer writes:—" These cases may be divided " into two groups. In the first group there were but 2 cases, occurring at " the same time, one being admitted on the 11th and the other on the 12th " January. After an interval of two months the second group of 11 cases " were admitted in rapid succession. There does not appear to have been " any connexion between these two groups of cases as far as causation is " concerned." Prior to the first 2 cases a man was admitted in December 1895, and previous to this case there had not been any admission since 1891.

India.

At the time of the occurrence of the 2 first cases there had been no enteric fever for a considerable time among the civil population, and there is nothing worthy of note in the antecedent circumstances of these cases; the men had not been away from the station or visited the jungles for sport, &c. The general sanitary condition of barracks and their surroundings was good and the water supply pure, but for a short time the milk supply of the men and the "ginger pop," which they were very partial to, were open to suspicion; there is, however, no evidence that either contained the enteric microbe, while such a limited outbreak seems unlikely to have been caused by impurity in drinks common to the whole detachment; it was probably caused by casual drinks in the bazars. With regard to the second group of 11 admissions with 4 deaths the medical officer states:—"It must be borne "in mind that there were no cases between the 12th January and 16th "March. On the 28th February a force of 52 non-commissioned officers and "men left Cannanore for Calicut to take the place at the latter station of "others proceeding to suppress a Moplah outbreak. The men marched to "Badagara, a distance of 25 miles, and completed the journey in boats on the "backwater. The weather was hot and the men were thirsty, and they freely "drank of water from many wells by the wayside, which are without doubt "open to contamination; it is also quite possible that some of the men "tasted the water of the backwater, which is filthy and brackish. At Calicut "they remained in barracks under ordinary conditions. They returned to "Cannanore by the same route on the 15th March, having left one of their "number sick with enteric fever at Calicut. Immediately on their return "they began to report sick, and 11 cases of enteric fever were admitted to "hospital as follows, all occurring amongst the men returned from the "march, and none at all amongst the men who had remained at Cannanore: "—On the 16th March, 1 case; on the 18th, 2 cases; on the 21st, 2 cases; "on the 24th, 2 cases; on the 28th, 1 case; on the 30th, 1 case; on the 7th "April, 1 case, and on the 14th April, 1 case. In many cases the illness was "advanced on admission, and it is evident that the disease was contracted "away from Cannanore. The cases were generally severe, and 4 ended "fatally; they occurred all about the same time, and I think the facts "indicate a wholesale poisoning through the alimentary canal. There is no "doubt in my mind that the disease arose from drinking impure water on the "march to and from Calicut, but it is not feasible to indicate the exact source ". . . . The sanitary state of the station was good at the time, and the "water supply pure. There has been no further appearance of the disease "since the 14th April."

Other Continued Fevers.—There were 2,111 cases of simple continued fever and 1 of cerebro-spinal fever, a total of 2,112 admissions, but no death, and the average number of men constantly sick was 107·24, being in the ratios of 30·0 per 1,000 for admissions, and 1·52 for constantly sick, an increase of 9·1 and ·50 respectively on the corresponding ratios of the previous year. In the preceding year the death rate was ·04. Compared with the average rates of the preceding ten years there is a decrease of 26·2 in the admission and of ·72 in the constantly sick rate, the decline in the death rate being ·04. The highest rate of admission, 140·3, occurred in the Mandalay district, the ratio for 1895 standing at 32·9 per 1,000, followed by 112·3 in the Allahabad district, which in the previous year gave a rate of 54·3, and by 80·5 in the Rangoon district, which was fifth in the preceding year with 54·1. In the Belgaum and Sind districts there were no admissions, and the next lowest rate, ·3 per 1,000, occurred in the Peshawar district, as compared with 2·2, the lowest but one, in 1895; the next above being 4·9 in the Aden district, a decrease of 96·3, and the next, 5·0, in the Presidency district, the rate for the year before being 13·6. In addition to the districts already mentioned, the Lahore and Oudh districts show an increase of 61·5 and 21·8 respectively, whil in the Deesa and Bundelkhand districts there has been a decrease of 138·9 and 38·9 respectively.

Cholera caused 70 admissions and 63 deaths, as compared with 44 and 32 in 1895, the equivalent ratios being 1·0 and ·89, which are higher respectively than those in the preceding year by ·4 and ·42 per 1,000, and lower by ·9 and ·43 than the average rates for the previous ten years. Abstract XVIII. shows the stations at which cholera occurred in each quarter of the year. It will be seen that 28 cases with 23 deaths occurred in the first quarter, 16 cases (all fatal) in the second, 26 cases and 24 deaths in the third, and no case in the fourth quarter. The station at which the greatest number of cases is shown was Poona, where all of the 13 men attacked died. The medical officer states that cholera prevailed in the station from June to September; the troops in Wanowrie barracks had the first case on the 21st July and had 10 cases in all, the last on 20th July; the disease appeared in Ghorpuri barracks on 31st July, where 2 other cases occurred, the last on the 3rd August. *India.*

At Jhansi there were 16 cases, 15 proving fatal, but 6 of these fatal cases occurred in the rest camp in the month of March and are shown among troops on the line of march. The outbreak in the station occurred in a draft of the 1st Battalion Royal Welsh Fusiliers which arrived on the 2nd April, most of the men being located in No. 2 barrack from which the first man was taken to hospital on the following morning; the men in the barrack were immediately placed under canvas, but two more were attacked on the evening of the 3rd, and the fourth man on the morning of the 4th April; the men was then removed to sanitary camp, where four more cases occurred, one on the 4th, two on the 5th, and one on the 8th April. To avoid the Hoshangabad rest camp, where it was supposed the disease was contracted by the party which passed Jhansi in March, the draft of the Royal Welsh Fusiliers was sent round viâ Jubbulpore. The next case occurred on 6th May in No. 3 Infantry barrack, the man recovering, and the last case, which proved fatal, was a man admitted from No. 2 Royal Artillery barrack on the 12th July. The origin of the disease could not be traced.

At Benares there were 12 cases, 7 proving fatal. The outbreak commenced on the 14th March in the wing of the Derbyshire Regiment, which was moved into sanitary camps, where 6 out of the 12 cases occurred, 3 proving fatal. No cause could be assigned.

At Bangalore 4 men were admitted and all died. In the early part of the year cholera was prevalent to a considerable extent among the civil population, chiefly natives. Amongst the troops 3 cases occurred in July and 1 in August; the first case occurred in a gunner of the 5th Field Battery on the 2nd July, he probably contracted the disease in one of the low slums of the station which he had visited on the preceding afternoon and where a fatal case of cholera had occurred; the second case occurred on the 28th July in a private of the 1st Battalion Dorsetshire Regiment; in this case the origin of the disease could not be traced, cholera was, however, prevalent in the neighbourhood of the barracks; the third case occurred on the 29th July in the same regiment, the man had been brought from the Hebbal musketry camp and probably contracted the disease at Bangalore as there were no other cases in the camp; the last case occurred, also in the Dorsetshire Regiment, on the 2nd August, the man probably contracting the disease in the bazar where he had spent a considerable time.

At Fort William there were 2 fatal cases among the warders of the military prison. Both the water and the milk were examined, but the cholera microbe was not found in either. One of the men had not used the milk nor had he visited the bazar where cholera was prevailing at the time, although the other man had.

At Saugor on the 24th and 25th April 2 fatal cases occurred among men of the 2nd Battalion Royal Irish Regiment living in different barracks, but one man was on magazine guard when he became ill. The cholera microbe was found (1) in the water of the guard-room chattie, (2) in the water of the filter in the barrack occupied by one of the men, and (3) in the water of the filter well from which all the potable water is used in barracks. On the occurrence of the first case permanganate of potash was put into the filter well, and on the second case occurring all water was boiled. After the addition of the permanganate to the filter well, samples of water, sand, &c., from different places, including those mentioned, were examined bacteriologically and in none were the microbes found. The medical officer thinks this points very strongly to the value of permanganate of potash when added to water containing cholera microbes. No other cases occurred among the troops nor was diarrhœa prevalent.

There were 2 cases of cholera amongst the troops at Muttra, both of which proved fatal. The first case occurred on the 26th March and the second on the day following from the same troop and barrack. The men were "chums"

India. and generally had their meals and went about together, and stated they had partaken of nothing to eat or drink outside the common except some fruit obtained near the jail; they could not name the fruit nor could it be procured for examination. The barrack was vacated, the men being placed under canvas, the walls scraped and limewashed, and the water boiled and treated with permanganate of potash. The medical officer states that if any of the supplies had been contaminated the disease would have been more general and not confined to two men only.

At Mhow a draft arrived from England on the evening of the 11th March. That night a man of the party was attacked with cholera and the following day another man; both died. It appears that these men during their stay at Deolali between the 6th and 10th March, had, contrary to orders, visited Nasik, where the disease was more than usually prevalent. No further cases occurred; diarrhœa was not prevalent nor were there any cases of cholera in the bazar.

At Indore 2 cases occurred in July, both of which proved fatal. The first occurred in the station hospital where the man had been two days under treatment for malarial fever; the second man had come off duty from the Treasury guard. The cause of the disease could not be traced, but cholera was prevalent at the time in the Residency bazar and diarrhœa in the station.

At Dinapore 2 cases of cholera occurred. The first man attacked belonged to the 2nd Field Battery, living in No. 1 Royal Artillery barracks; he recovered; the second case, which proved fatal, was a man of the 2nd Battalion Manchester Regiment living in No. 13 Infantry barracks. The disease was prevalent in the surrounding villages and bazars, which were placed out of bounds.

At Nowgong there were 2 cases, one proved fatal; the men belonged to the 1st Battalion Royal Welsh Fusiliers. Permanganate of potash was put into the water when these cases occurred.

There were 8 fatal cases amongst troops on the line of march, including the 6 at the Jhansi rest camp, already referred to, and one man of the unattached list not admitted to hospital. There was also one fatal case each at Barrackpore, Amritsar, Rawal Pindi, Campbellpore, Rangoon, Mandalay, Ahmednagar, Deolali, and Ahmedabad; an admission at Roorkee and a death from previous year's admission at Bombay.

Dysentery.—There were 1,841 admissions for dysentery and 48 deaths, including that of an invalid who had left the Command, being in the ratios of 26·1 and ·68 per 1,000, which are lower respectively by 2·5 and ·14 than the preceding year's rates; compared with the ten years' average the ratios are lower by 2·7 and ·04 respectively. The average number of men constantly sick was 127·73, giving a ratio of 1·81 per 1,000, which is ·12 lower than in the previous year, and ·17 less than the average of the preceding ten years. Abstract XIX. shows the prevalence of this disease in each military district in India, and Abstract XX. its prevalence in each quarter of the year. The highest admission rate, occurring in the Madras district, was 65·5 per 1,000, which is an increase of 2·8 on the preceding year's ratio, the second highest being 61·6 in the Narbudda district, an increase of 26·8, and the third, 58·0, in the Presidency district, a decrease of 24·8. In the previous year the three highest rates were in the Presidency, Madras, and Secunderabad districts. The lowest ratio, 6·6 per 1,000, was in the Deesa district, as compared with 14·1 in 1895, the next lowest being 10·9 in the Rawal Pindi district, a decrease of 3·5, and 11·6 in the Lahore district, a decrease of 14·2. Mortality was highest in the Narbudda district, 5·32 per 1,000, as compared with 2·27, and next in the Bombay district, 1·85, as against ·54 in the preceding year. The lowest mortality ratio was ·30 in the Rohilkhand district, a decrease of ·59, the next above being ·31 in the Rawal Pindi district, which was lowest in 1895 with ·18. No mortality occurred in the Bundelkhand, Sirhind, Madras, Southern, Bangalore, Aden, Nagpur, and Quetta districts. Comparing the four quarters of the year as to seasonal prevalence of the disease, the highest admission ratio, 7·6 per 1,000, is again met with in the third, followed by 6·5 in the second, 6·4 in the fourth, and 5·7 in the first quarter. The mortality rate was highest, ·23, in the second quarter, followed by ·21 in the third, ·13 in the fourth, and ·10 in the first quarter.

At Secunderabad there were 137 admissions with 1 death, as compared with 151 and 1 in 1895. The majority of the cases were of a very mild type. *India.*

At Rangoon there were 74 admissions with 3 deaths, as compared with 88 admissions in 1895. Most of the cases occurred during the monsoon, as in previous years.

At Bangalore there were 65 admissions but no deaths; the chief cause being chill and damp in the monsoon, and neglect in clothing.

At Lucknow there were 63 admissions, as against 75 in 1895. The cause of the disease is obscure; it was not usually prevalent at any particular season.

At Jubbulpore there were 60 admissions with 5 deaths. The disease was mostly prevalent in the months in which enteric fever was at its worst, April and May, and was of a very malignant type. The water supply during this period was found to contain suspended matter.

At Fyzabad there were 59 admissions, the largest number, 12, occurring in the month of March. The disease had been prevalent in the 2nd Battalion Royal Sussex Regiment at Dum Dum, before arrival at Fyzabad in December 1895.

At Barrackpore there were 55 admissions, but many of the men were re-admitted, in all there were 42 individuals attacked; of these, 2 were admitted in March, 1 in May, 2 in June, 14 in July, 5 in August, 9 in September, and 3 each in October, November, and December. The medical officer states that the construction of the water reservoir of the station was favourable to the growth of micro-organisms in the collected sediment, which on bacteriological examination was found to abound with schizomycete organisms.

At Dum Dum there were 30 admissions with 1 death, as against 86 and 6 in 1895. This decrease was considered to be probably due to the abolition of the Macnamara filters, and the treatment of drinking water with permanganate of potash, which seems to have a beneficial effect on the health of the troops.

The *other diseases* of this sub-group included 808 cases of influenza (8 fatal), 12 of mumps, and 1 each of whooping cough and diphtheria, a total of 822 cases with 8 deaths, the equivalent ratios being 11·7 and ·11, as against 8·5 and ·03 respectively in the previous year.

Malarial Fevers.—Under this head are included 16,363 admissions for ague with 5 deaths, 977 cases of remittent fever with 28 deaths, and 485 cases of malarial cachexia with 4 deaths, including those of two invalids who had left the Command, giving a total of 17,825 admissions and 37 deaths, with an average constantly sick of 715·51 men. The ratio of admission therefore was 252·9 per 1,000, that of mortality ·53, and of constantly sick 10·15. These rates were respectively 89·3, ·04, and 2·40 per 1,000 lower than those of the previous year, and 107·0, ·19, and 1·39 respectively below the average of the preceding ten years. The greatest ratio of prevalence of these diseases in any district was 827·8 in Deesa, in excess of the previous year's rate by 397·4; the Sind district, which had the highest ratio in 1895, coming next with 747·6, a notable decrease of 1082·2; Narbudda, which was fourth in the previous year, being third with 686·9, an increase of 166·9. The lowest ratio, 51·8 per 1,000, occurred in the Bangalore district, which was lowest but one in 1895, and shows a decrease of 36·7, the next lowest being 88·8 in the Madras district. In addition to Deesa and Narbudda, the Bundelkhand, Nagpur, Oudh, and Southern districts show increased rates of 49·7, 47·8, 45·6, and 23·9 severally, but in no other district was the rate increased by more than 20·0. Of the districts having reduced ratios, besides Sind, the most marked decreases were those in Lahore, 603·7; Quetta, 250·2; Aden, 135·8; Presidency, 125·8; and Meerut, 109·9. Of the 35 deaths in India, 8 occurred in the Presidency district, 6 in Rawal Pindi, 5 in Peshawar, 3 each in the Narbudda and Meerut districts, 2 each in the Deesa and Quetta districts, and one each in the Allahabad, Sirhind, Lahore, Mhow, Aden, and Nagpur districts.

Septic Diseases.—There were 112 admissions and 12 deaths, including 108 cases (8 fatal) of erysipelas, 3 fatal cases of septicæmia, and one (fatal) of pyæmia. The ratio of admission was 1·6, against 1·1 per 1,000 in the preceding year, and 1·5 the average rate for ten years, and that of mortality ·17, as against ·10 in both the comparisons. The districts contributing the largest number of cases were Quetta with 21, Rawal Pindi with 18, and Sirhind with 15.

Venereal Diseases.—For *primary syphilis* alone there were 11,228 admissions, equivalent to a ratio of 159·3 per 1,000, which is lower by 19·4 than in the preceding year, and higher by 36·3 than the average rate. The average number of men constantly sick from this cause amounted to 1022·14, being in the ratio of 14·50, which is also lower than in the previous year by 1·82, but above the ten years' average by 4·18. For simple venereal ulcer there were 4,733 admissions, and 365·85 men were constantly sick, making a total of 15,961 admissions for primary venereal sores, with 1387·99 men constantly sick, and giving an admission rate of 226·4 per 1,000, a decrease of 19·1 from that of 1895, but an increase of 33·0 on the ten years' average, and a constantly sick rate of 19·69, a decrease of 2·11 from that of the previous year, and an increase of 4·35 on the average for the preceding ten years. The admissions for *secondary syphilis* were 6,888, 16 deaths were recorded, including 2 of invalids, and there were 738·22 men constantly sick. The admission ratio, 97·7 per 1,000, that of mortality, ·23, and that of constantly sick, 10·47, were higher by 10·9, ·01, and 1·63 respectively than in the preceding year. Compared with the average of the previous ten years, the rates of admission, death, and constantly sick have increased by 41·9, ·12, and 4·90 respectively. *Gonorrhœa* furnished 13,209 admissions, or a ratio of 187·4, with an average constantly sick of 1036·22 men, equal to 14·70 per 1,000. Here a decrease is noticed of 17·2 in the admission and of ·97 in the constantly sick rates as compared with 1895, and an increase of 14·4 and 2·24 respectively as compared with the ten years' average. There was one death from this affection. Taking all these forms of venereal disease together, the ratio of admissions amounts to 511·6 per 1,000, which is less than that of the preceding year by 25·3, and more than the average rate by 89·4, while for constantly sick the ratio was 44·87, representing a loss of 3162·43 men to the efficient strength of the force from these diseases, the ratio being lower than in 1895 by only 1·44, but above the average by 11·50. Comparing next the prevalence of the different forms of these diseases in the various districts, as shown in Abstract XV., the Belgaum district gave the highest ratio of admission for primary syphilis, 301·3 per 1,000, exceeding that of the year before by 42·6, the next being the Rohilkhand district (also second both in 1894 and 1895) with 300·7, a decrease of 1·8, and the third the Mhow district (which stood tenth in the preceding year) with 274·7, an increase of 86·4. The lowest rate, 33·5, occurred in the Nagpur district, a decrease of 38·4; the next lowest were 46·7 in the Peshawar district, also lowest but one in 1895 with 70·2, and 54·5 in the Sind district, a decrease of 42·7. Besides those mentioned, the admission rate decreased in the Oudh district (which had the highest admission ratio in the year preceding) by 125·7, in Rawal Pindi by 92·7, in the Presidency by 58·0, in the Mandalay by 75·6, in the Poona by 60·8, in the Deesa district by 96·8, and to a lesser extent in other districts. The principal instances of increase on the rates of 1895 were 66·0 in the Quetta district, 33·7 in Meerut, 24·2 in Sirhind, and 22·8 in the Bombay district. Secondary syphilis was most prevalent in the Deesa district, the admission ratio being 182·1 per 1,000, or 92·9 in excess of the previous year's rate. The next highest ratio, 156·7, occurred in the Rohilkhand district, which was highest in 1895 with 159·7, followed by 151·6 in the Bombay district, an increase of 58·2. The lowest ratio of admission was 44·0 in the Nagpur district, an increase of 8·0; the next lowest being 55·7 in the Peshawar district, a decrease of 18·9, and 60·4 in the Rawal Pindi district, a decrease of only ·3. Decreases in ratios of 35·5 and 15·4 occurred in the Quetta and Narbudda districts respectively, but in no other district was the decline over 10·0 per 1,000. The rates increased in 18 out of the 26 districts in India, the most important increases being, besides those already mentioned, 60·9 in Aden, 40·4 in Sind, 39·0 in Meerut, 33·4 in Bundelkhand, 23·4 in the Presidency, and 21·6 in the Mhow districts. The highest ratio of prevalence of gonorrhœa was 347·6 in the Bundelkhand district, or 34·6 higher than in the previous year, when this district also gave the highest admission rate; the next being 294·7 in the Deesa district, an increase of 72·5, followed by 254·4 in the Rohilkhand district, an increase of only 1·0. The lowest admission rate was in the Peshawar district, 107·2, a decrease of 33·2; the next lowest being 131·4 in the Rawal Pindi district, a decrease of 13·1, and 145·6 in the Belgaum district, a decrease of 22·8. The other districts having an admission ratio increased by over 40·0 per 1,000 were Bangalore, Sind and Madras, with increases of 51·6, 41·4, and 41·1 respectively, while the districts having a decrease above 40·0 were Allahabad, lower by 87·1, Poona by 65·3, Narbudda by 60·7, Southern by 59·9, Mandalay by 50·6, and the Presidency district by 40·3. *India.*

The Principal Medical Officer states that at some stations venereal was extremely prevalent. The following remarks are compiled from the reports of medical officers in charge of stations which show a large number of admissions:—At Secunderabad there were 1,656 admissions, as against 1,541 in 1895. At Quetta, where there has been a steady increase since 1891, reaching, in 1895, 176 admissions for primary syphilis, 295 for secondary syphilis, and 395 for gonorrhœa, the admissions for these forms of venereal disease during the year under report were 326, 208, and 379 respectively, being an increase in the first and last, but a decrease in the second, the total admissions, including simple venereal ulcer, being 1,167. Eight men were invalided for secondary syphilis, and it is doubtful whether any of them will be able to return to duty. At Meerut there were 1,090 admissions, but the ratio was only 543·9 (low in comparison with the rate at other stations). There was a decrease in the admissions for gonorrhœa, but for the other forms a very marked increase. There is no doubt that the disease is increasing steadily both in numbers and in virulence, a large per-centage of the men becoming constitutionally affected. At Poona the admissions numbered 1,080, but there was a marked decrease in admissions for primary venereal disease, probably due to the bazars having been placed out of bounds from 1st April to 4th September, owing to cholera and small-pox. At Mhow there were 1,060 admissions, 205 less than in 1895. The type of the disease is becoming more severe, the secondary symptoms coming on much earlier and proving less amenable to treatment, necessitating a large number of men being sent to the hills and being eventually invalided as unfit for further military service. At Umballa there were 309 admissions for primary syphilis, 108 for simple venereal ulcer, 186 for secondary syphilis, and 450 for gonorrhœa, making a total of 1,053, 42 less than in 1895, but unfortunately the decrease was only in cases of primary syphilis and gonorrhœa, secondary syphilis showing an increase of 11, while the large number of men invalided (33 as against 3 in 1895) testifies to the increasing severity of the disease. Mercurial injections were tried for some time, but the results were not considered very satisfactory. At Lucknow the admissions, 1,016, were less than in 1895, and 26 men were invalided for syphilis. The three highest admission rates were 1069·6 at Ahmedabad, 1057·3 at Nowgong, and 1046·4 at Shahjahanpur. At Nasirabad the rate was 871·9, and there were 306 cases of primary syphilis against 119 in 1895, 216 of gonorrhœa against 185 in the previous year, 74 of ulcer of penis against 44 in the preceding year, and 71 of secondary syphilis against 101 the year before. The foregoing figures show how rapidly venereal diseases are increasing. Two men were invalided, but many who have had venereal disease have been left in a very debilitated state, and are quite unfit for active service or marching. At Jhansi the disease has been steadily increasing, causing an admission of 810 men into hospital, being in the ratio of 859·9 per 1,000 of strength, 42 per cent. of the total admissions for all causes of sickness in the garrison, and a loss of the services of nearly 9 per cent. of the strength per annum. There is a marked increase in the severity of the disease as is shown by the average duration of each case having risen from 27 days in 1895 to 35 days in the year under report. Hypodermic injections of lanolin and mercury were found to give good results when every other treatment in a very severe case of secondary syphilis had failed. At this station it was noted that 413 men were admitted for venereal disease once only, 188 twice, 133 thrice, and 76 four times or oftener. At Neemuch the admissions were 281, as compared with 268 in 1895, being in the ratio of 859·3 per 1,000 of strength. Some of the cases of primary syphilis were very severe, the sores assuming phagadænic action. The admission rate at Saugor was 849·2, the admissions being 304. The hypodermic injection of mercury was freely resorted to with excellent results. This treatment enables many men, who would otherwise be in hospital, to perform their usual duties; it brings the

India.

patient more quickly than the old method under the influence of the drug, and does not derange digestion. Moreover, the disease yields more readily to the treatment, but is apt to cause somewhat sharp salivation at times. At Dinapore the ratio was 800·3, the admissions being 645; out of the 87 cases of secondary syphilis 5 men were invalided, and one was to be invalided in January 1897. There were 252 admissions at Chaubattia, being in the rate of 766·0 per 1,000, and 8 men were invalided for secondary syphilis; these men presented severe constitutional symptoms with repeated relapses. The cases contracted at Ranikhet were of a virulent type, in some instances secondary symptoms supervening long before the initial sore had healed, and a large number of cases were treated with hypodermic injections of mercury, apparently with benefit, and certainly with convenience to the hospital, preventing overcrowding, the men attending once or twice a week to be injected, and in the meantime performing their ordinary duties. At Chakrata the admissions were 693, the ratio being 759·0, and 5 men suffering from secondary syphilis were invalided. Many of the cases were of a severe type; the primary sores were in some instances phagadænic. Hypodermic injections of a mixture of lanolin, olive oil, and mercury were given in 26 cases with good results. At Madras venereal disease was the chief cause of admissions into hospital, giving 411 out of a total of 869, equivalent to 739·2 per 1,000 of strength, and 99 in excess of those of the previous year. Three men were invalided for secondary syphilis. At Malapuram the admission rate was 929·7. The admissions for primary syphilis and gonorrhœa were less than in 1895, but cases of secondary syphilis increased by more than half the number in the previous year; many of these cases were obstinate, and remained under treatment for a long time. At Shwebo the admission rate was 726·7 per 1,000, and 6 men were invalided for secondary syphilis. Most of the admissions were due to venereal, and were it not for this disease the per-centage of sick would have been small.

Under Sub-group V. are included 3 fatal cases of *hydrophobia;* a similar number occurred in the previous year. Two of the cases occurred 2 at Camp Gharial and the third at Quetta. The first patient at Gharial was bitten by a fox three weeks previous to admission into hospital on the morning of the 27th July. He died the following morning. The symptoms of the case pointed to hydrophobia, but the cause is obscure, as subsequent investigation failed to elicit any proof whatever that rabies existed in the young fox which bit the deceased. In the case of the second man it is stated that he was bitten by a young dog at Ghora Dhaka, but the date could not be ascertained. He was admitted into hospital on the 19th September with a slight attack of fever, and next day symptoms of hydrophobia set in; he died on the 23rd September. The patient at Quetta reported sick on the afternoon of the 16th of May, complaining of sore throat and fever. Next morning symptoms of hydrophobia were pronounced, and he died on the following day. A distinct history of a bite on the left thumb from a dog about two months previously was obtained. The man did not have the bite cauterised, and the dog was shot shortly after having bitten him as it had unmistakable symptoms of hydrophobia.

Parasitic Diseases.—There were 193 admissions, which included 169 for tænia solium and 9 for tænia mediocanellata, giving a ratio of 2·7 per 1,000 against 2·5 in 1895, and 3·4, the ten years' average rate. The highest ratio was 9·9 in the Deesa district, followed by 8·8 in the Mandalay, and 6·6 in the Sirhind districts; the lowest rates, ·3 and ·4, occurred in the Peshawar and Allahabad districts respectively.

Scurvy.—There were 18 cases of this disease against 54 in the previous year, the ratio, ·3 per 1,000, being lower than that for the preceding year and the decennial average by ·5 and ·4 respectively. Five cases occurred in the Deesa district, 2 each in the Oudh and Narbudda districts, and 1 each in the Allahabad, Meerut, Lahore, Bangalore, Secunderabad, Rangoon, Poona, Mhow, and Aden districts.

Alcoholism.—There were 293 admissions and 4 deaths, including 17 cases of delirium tremens, 1 of which was fatal. The admissson rate, 4·2 per 1,000, was higher than that of the previous year by ·3, but lower than the ten years' average ratio by 4·2. The highest ratio of prevalence was 19·9 in the Deesa district, which was second the previous year with 9·4, the next, 11·7, in the Aden district, which stood third the year before with 7·7, and then 9·4 in the

India.

Presidency district, which was highest in the preceding year with 9·9. The lowest rate was ·7 in the Sind district, and the next above, 1·4 in the Southern district.

Debility, &c.—1,205 admissions are returned under Group C., of which 1,197 were for debility with 1 death. The admission rate, 17·1 per 1,000, is 1·0 below that of 1895, and 7·0 lower than the average of the preceding ten years. There were 91·29 men constantly inefficient from this cause, in the ratio of 1·30 per 1,000, as compared with 1·21 in the year before, and 1·58, the decennial average rate. The highest admission ratio in any district was 76·2 in Deesa, an increase of 52·7 on that for 1895. The next highest was 39·8 in the Bombay district, which stood highest the year before with 48·0, followed by 33·2 in the Madras district. The lowest ratio, excluding the Nagpur district, where there was no admission, was 2·6 in the Quetta district, the next lowest being 8·6 in the Belgaum district, which was the lowest in the previous year with 4·0. The only death from debility occurred in the Peshawar district.

For *Rheumatism* 2,198 admissions and 1 death are recorded, of which 76 admissions were for rheumatic fever. The admission ratio, 31·2 per 1,000, was higher than in the previous year by 3·6, and than the preceding ten years' average rate by 1·4. The death rate, ·01, was lower than in the year before by ·03, and below the decennial average rate by ·05. The number constantly sick was 168·19 men, being in the ratio of 2·39, as against 1·92 in 1895, and 2·05, the average of the preceding ten years. The highest rate of prevalence, 62·7, was in the Mhow district, an increase of 30·8 on that for the preceding year; the Southern district gave the next rate, 58·8, an increase of 29·5, followed by Sind with 52·5, an increase of 18·3. The lowest admission rate again occurred in the Narbudda district, 11·4 per 1,000, a decline of 3·7, followed by 12·4 and 17·9 respectively in the Nagpur and Bangalore districts, a decrease of 14·3 on the rate for 1895 in the former and an increase of only ·7 in the latter district.

Tubercular Diseases caused 354 admissions and 64 deaths, 13 of which occurred in invalids who had left the Command, being in the ratios of 5·0 and ·91 per 1,000, as compared with 4·7 and ·75 respectively in the previous year, and 3·5 and ·82, the corresponding average rates for the preceding ten years. 343 admissions and 55 deaths were due to lung affection. Every district, except the Southern, which was the third highest in 1895, had cases of these diseases. The Bombay, Madras (which were the second and highest in the previous year) Secunderabad, and Deesa districts furnished the highest admission ratios, namely, 31·9, 19·7, 16·3, and 8·3, an increase of 8·7 and ·5 in the Bombay and Deesa districts, and a decline of 15·8 and ·3 in the Madras and Secunderabad districts, as compared with the corresponding ratios in 1895. In all the other districts comparatively low rates are observed, varying from 1·0 in the Nagpur district to 7·5 in the Belgaum district. Of the 51 deaths in India, 6 each occurred in the Oudh and Bombay districts, 4 each in the Meerut, Rohilkhand, Sirhind, Rawal Pindi, and Madras districts, 3 in the Peshawar, 2 each in the Allahabad, Narbudda, Mhow, and Nagpur, and one each in the Presidency, Bundelkhand, Secunderabad, Rangoon, Mandalay, Poona, Deesa, and Quetta districts.

Other diseases of Group D. gave 482 admissions and 5 deaths, the equivalent ratios being 6·9 and ·07 per 1,000, as compared with 7·8 and ·09 in 1895, and 10·6 and ·14, the respective average rates. The admissions were chiefly for anæmia (186) and non-malignant new growths, 3 were due to sarcoma, 1 to carcinoma, and there were 56 cases of scrofula, 3 of purpura, 1 of hæmophilia, and 6 of diabetes mellitus. The deaths were 2 each from sarcoma and purpura, and 1 from scrofula.

LOCAL DISEASES.—*Diseases of the Nervous System.*—670 admissions are returned and 16 deaths, inclusive of that of an invalid; the equivalent ratios were 9·5 and ·22 per 1,000, being 1·6 higher and ·16 lower respectively than those for the previous year, and 1·0 and ·15 respectively below the corresponding average rates for the preceding ten years. Of the total admissions 93 were cases of mental disease, equal to a ratio of 1·3 as compared with ·9 in 1895, and 1·7, the decennial average. The highest admission ratio for mental disorders was 5·1 in the Bombay district, followed by Nagpur and Madras with 4·8 and 3·6 respectively. In the previous year the highest ratios occurred in

India.

the Nagpur, Narbudda, and Madras districts in the order named. The lowest admission rates were ·5 and ·6, in the Sirhind and Rohilkhand districts respectively, the next lowest being ·7 each in the Meerut, Southern, and Mhow districts. The only death from mental disease occurred in the Poona district. Excluding cases of mental disease, the highest admission ratios for nervous diseases, 20·8 per 1,000, is shown by the Bombay district, which also had the highest ratio, 20·5, in the year before; the next being 15·1 in the Belgaum district, an increase of 9·9, and 14·9 in the Deesa district, an increase of 8·6. The lowest ratios were 1·0 in the Aden district, a decrease of 1·9; 2·9 in the Nagpur district, a decrease of ·8; and 3·1 in the Peshawar district, a decline of ·4, from corresponding ratios in the preceding year, in which the lowest rate occurred in the Nagpur district. The highest rate of mortality is noted in the Deesa district, 1·66 per 1,000, the next highest being in the Allahabad and Narbudda districts, ·80 and ·76 respectively as compared with the same and *nil* in 1895. There was no mortality in the Presidency, Rohilkhand, Bundelkhand, Sirhind, Peshawar, Madras, Southern, Bangalore, Belgaum, Rangoon, Mhow, Bombay, Aden, Sind, and Nagpur districts, and low mortality rates are recorded in the Rawal Pindi and Oudh districts, viz., ·16 and ·20 respectively. The principal causes of admission were neuralgia 355, epilepsy 76, vertigo 25, diseases of the brain and its membranes 21, and affections of the spinal cord 17. The deaths were due to apoplexy 3, hæmorrhage into the brain, inflammation of the membranes of the brain and spinal cord, inflammation of cerebral membranes, and abscess of the brain 2 each, and one each from congestion of the brain, hemiplegia, paraplegia, and melancholia. The death of the invalid was returned as paralysis.

Diseases of the Eye caused 786 admissions, being in the ratio of 11·2 per 1,000, which is identical with that for 1895, but 1·9 below the average rate for the preceding ten years. The highest rate of prevalence occurred in the Mandalay district, 25·5, which stood second the year before with 21·2, the next in order being Madras (which had the lowest ratio in 1895) with 24·2, an increase of 18·6, and Sind with 18·2, an increase of 5·1. The lowest ratio was 3·8 in the Nagpur district, a decline of 4·4, then 4·9 in the Rangoon district, less by 2·0, and 6·0 in the Quetta district, which was highest in 1895 with 21·7. Conjunctivitis was, as usual, the principal cause of admission, 546 cases of that disease being recorded, while of the others 37 were due to ulcer of cornea, 31 to iritis, 29 to myopia, 23 to blepharitis, 14 to stye, and 11 to keratitis.

Diseases of other Organs of Special Sense.—These were the cause of 1,157 admissions, equal to a ratio of 16·4 per 1,000, being higher by 2·5 and 1·6 than the previous year's and the average rates respectively; there were no deaths. The Sind district again leads with 64·6 per 1,000, an increase of 34·4 on the rate of the year before. Madras with 33·2 and Bombay with 24·0 came next in order, being 14·5 and ·3 higher than the previous year's rates. The lowest admission ratios were 4·6 in Bangalore, an increase of 1·8; 5·4 in Secunderabad, a decrease of 1·5, and 6·7 in the Nagpur district, an increase of 2·6. Of the cases included under this head 24 were nasal affections, the rest being due to aural diseases, chiefly affecting the external meatus, inflammation of which caused 868 admissions into hospital.

Diseases of the Circulatory System caused 692 admissions and 37 deaths, the latter including that of an invalid, equal to ratios of 9·8 and ·53 per 1,000 respectively. The admission rate is ·5 higher than that of the previous year, but ·9 lower than the average for the preceding ten years, while that of mortality is ·15 higher in both comparisons. There were 64·40 men constantly sick from these affections, being in the ratio of ·91, as compared with ·88 and 1·09 in the two comparisons. The highest admission rate was, as in the preceding year in the Bombay district, 52·2 per 1,000, being 4·5 lower than that of 1895; the next was 23·6 in the Sind district, 17·7 higher than in the preceding year; then 23·4 in the Rohilkhand district, an increase of 10·9. The lowest ratio was 1·7 in the Deesa district, a decline of 6·1 from that of the previous year, the next lowest being 2·5 in the Poona district, a decrease of ·9, and 2·9 in the Nagpur district, an increase of ·8. The Bombay district had the highest rate of mortality, 1·85 per 1,000, an increase of 1·31, followed by Madras (which had the second highest ratio in the previous year) with 1·79, an increase of ·85; the next being 1·66 in the Deesa district, against *nil* in the preceding year. Palpitation of the heart was, as usual, the cause of a large number of admissions, 393 being recorded, and there were 159 cases of valvular disease of the heart, 49 of varix, 21 of phlebitis, 13 of phlegmasia dolens, and 12 of aneurysm. The deaths in India were 11 from valvular disease, 6 from endocarditis, 4 each from thrombus and fatty degeneration, 3 each from dilatation of heart and aneurysm of arteries, 2 from aneurysm of aorta, and one each from pericarditis, hypertrophy of heart, and dilatation of ascending arch of aorta. The death of the invalid was due to valvular disease of the heart. *India.*

Diseases of the Respiratory System were the cause of 2,209 admissions and 58 deaths, including the deaths of three invalids who had left India, giving the ratios of 31·3 and ·83 per 1,000 respectively. The former is lower than the rate of the previous year and the average rate of the preceding ten years by 2·3 and 2·9, while the latter is ·17 higher than the rate of the year before and ·10 lower than the decennial average rate. The number of men constantly inefficient was 131·43, being in the ratio of 1·86, against 1·78 in 1895, and 1·93, the average rate. The highest ratio of prevalence was 57·9 per 1,000 in the Deesa district, which stood lowest in 1895 with 11·0, next in order being 48·4 in Mhow, an increase of 18·9, and 47·7 in Peshawar (which was highest in the previous year), a decrease of 53·9. The lowest rate of admission, 12·4, occurred in the Nagpur district, a decrease of 3·0 from that of the year before, the next lowest being 14·6 in the Aden district, a decline of 27·8, and 14·8 in the Sind district, or 16·7 less than in the year previous. Mortality was also highest in the Deesa district, the ratio being 4·97 against *nil* in the preceding year, the next highest being 2·28 in the Narbudda district, where there was no death in 1895, and 1·73 in the Peshawar district, which, with 3·92, stood highest in the preceding year. Of the 2,209 admissions 1,631 were for bronchitis, 369 for pneumonia, 115 for pleurisy, 35 for laryngitis, 25 for spasmodic asthma, and 11 for hæmoptysis, while of the 55 deaths in India, 45 were from pneumonia, 2 each from bronchitis, gangrene of lung, pleurisy, and empyema, and one each from necrosis of laryngeal cartilage and acute pneumonic phthisis. All the deaths of the invalids were due to pneumonia.

Diseases of the Digestive System caused 8,494 admissions into hospital and 108 deaths, three being those of invalids who had left the Command. The equivalent ratios, therefore, were 120·5 per 1,000 for the former and 1·53 for the latter, as compared with 113·6 and 1·79 in the previous year, and 131·5 and 1·82, the corresponding average rates for the preceding ten years. The constant inefficiency on account of these diseases was 384·48 men, equal to 5·45 per 1,000, against 4·83 and 5·53 respectively in the two comparisons. The ratio of prevalence was highest in the Sirhind district, 183·1 per 1,000, an increase of 49·1 on the rate of the year before; next in the Southern district, 168·6 or 57·6 above the previous year's rate, followed by 161·1 in the Quetta district, (which was highest in the preceding year with 219·6), a decline of 58·5. The lowest ratio, 54·5, was in the Nagpur district, which was also lowest in the preceding year with 37·0, that in the Belgaum district, 72·2, being the next lowest, an increase of 3·4 on that for 1895, followed by 92·3 in the Bangalore district, 15·1 above the rate of the year before. The mortality rate was highest in the Narbudda district, 4·56, as compared with 3·02 in the preceding year, the second ratio, 3·69, being observed in the Presidency district, an increase of 1·49, followed by 3·59 in the Madras district (which had the highest death rate, 7·48, in the previous year), a decrease of 3·89. No death occurred in the Southern, Bangalore, Secunderabad, and Deesa districts; excluding these, the lowest rate, ·39, was in the Lahore district, an increase of ·17, the next lowest being ·63 in the Rawal Pindi district, a decrease of ·79, and ·66 in the Mhow district, 1·77 lower than in the preceding year. The principal causes of admission were affections of the mouth and throat 2,881 cases, diarrhœa 1,419, hepatic disorders 2,150 (including 872 cases of congestion of liver, 621 of hepatitis, 435 of jaundice, and 153 of hepatic abscess), dyspepsia 778, piles 450, colic 325, inflammation of intestines 150, hernia 93, and inflammation of stomach 81. The deaths in India comprised 86 from hepatic abscess (36 of which were associated with dysentery), 4 from peritonitis, 2 each from cirrhosis of liver, hepatitis, strangulation of intestines, abscess in sub-peritoneal tissue, inflammation of intestines, and inflammation of stomach, and one each from perforation of intestines, diarrhœa, and yellow atrophy of liver. Two of the deaths of invalids were due to abscess of liver, and the third to hepatitis. Abstract XIX. exhibits the prevalence of and

India. mortality from diarrhœa and hepatic diseases in the several districts in India, and Abstract XX. the prevalence of and mortality from these diseases in each quarter of the year. The ratio of admission for diarrhœa was 20·1 per 1,000, against 20·9 in the preceding year, and the mortality rate ·01 against ·06. The greatest prevalence was, as in the preceding year, in the Sind district, which had a ratio of 37·0 against 59·8, being the greatest decrease (22·8) in the year under report; the next was 36·8 in the Sirhind district, an increase of 8·8, followed by 34·9 in the Presidency district, 7·4 higher than in the previous year. Except Belgaum, where there was no admission, the Nagpur district, which was the second lowest the year before with 5·1, gave the lowest ratio, 3·8 per 1,000, the next lowest being 3·9 in the Aden district and 4·5 in the Madras district, lower than in the preceding year by 2·8 and 2·0 respectively. The next large decreases occurred in the Lahore and Deesa districts, the ratios, 21·3 and 26·5, being lower than in 1895 by 17·7 and 17·3 respectively. The single death from diarrhœa occurred in the Meerut district. The prevalence of this disease was, as in the preceding year, greatest in the third quarter of the year, when the admission rate was 7·3 per 1,000, the next rate being 5·5 in the second, then 3·8 in the first, and 3·4 in the fourth quarter. The death occurred in the third quarter. The ratio of admission for hepatic diseases was 23·5, and that of mortality 1·28 per 1,000, as compared with 19·9 and 1·48 in the preceding year. The rate of prevalence was highest in the Madras district, 67·3, an increase of 23·3, and next came Mandalay with 60·3, an increase of 14·7; these districts stood in reverse order in the previous year. Rangoon was, as in the year before, third with 51·2, an increase of 15·1. The lowest ratio of admission was again in the Quetta district, 6·9, or only ·5 more than in the previous year, the next lowest being 8·6 and 9·3 in the Belgaum and Peshawar districts, lower by 3·1 and 4·7 respectively. Mortality was highest in the Narbudda district, the ratio being 4·56 as compared with 3·02 in the preceding year, when it stood third; the next highest being 3·59 in the Madras district, which had the highest ratio, 7·48, in 1895, followed by 3·35 in the Presidency district, an increase of 1·52. Excepting the Southern, Bangalore, Secunderabad, Bombay, and Deesa districts, where there was no death, the lowest mortality rate was ·20 in Lahore, against *nil* in the year before, the next lowest being ·43 in Quetta, and ·47 in Rawal Pindi, a decrease of ·42 and ·77 respectively. With regard to the seasonal prevalence of these disorders, the highest admission ratio occurred in the third quarter of the year, 7·0 per 1,000, followed by 6·0 in the second, 5·3 in the first, and 5·2 in the fourth quarter, identical with the seasonal prevalence of diarrhœa. Mortality was also greatest in the third quarter, viz., 25 deaths, or ·35 per 1,000, the next highest mortality being in the first and fourth quarters, which had 22 deaths each, or ·31 per 1,000, followed by 21, or ·30 in the second quarter of the year.

Diseases of the Lymphatic and Glandular System.—2,187 admissions and one death are recorded, the admission rate being 31·0 per 1,000, which is an increase of 1·2 on that of the preceding year, but a decline of ·9 from the ten years' average rate; the death ratio, ·01 per 1,000, is similar to that of the previous year, but ·02 less than the decennial average rate. There were 245·89 men constantly inefficient, representing a ratio of 3·49, identical with that of the year before, and only fractionally above the average rate for the preceding ten years. The highest admission ratio was 56·6 in the Belgaum district, higher by 19·9 than that of the year before, while the two next ratios, 43·6 and 40·8, were in the Bangalore and Oudh districts, an increase of 13·4 and 5·0 respectively. The lowest rate, 13·1, occurred in the Peshawar district, which stood last but one in 1895 with 11·8, the next lowest being 15·6 in the Aden district, a decline of 4·6, and 19·4 in the Quetta district, as compared with 8·1, the lowest in the preceding year. Of the admissions, 2,065 were due to inflammation and suppuration of lymph glands, and 93 to disease of the spleen. The death was due to abscess of spleen, and occurred in the Deesa district.

Diseases of the Urinary System.—There were 154 admissions and 15 deaths, the latter including two among invalids who had left India; the admission rate was 2·2 and the death rate ·21 per 1,000, as compared with 1·9 and ·21 respectively in the previous year, the average rates for the preceding ten years being 2·1 and ·17. The highest ratio of admission, 5·7, was in the Southern district, which was the lowest but one in 1895 with ·7; the next highest, *India.* 4·9, occurred in the Rangoon district, as compared with 2·3, followed by 4·2 in Bombay, which had the highest (9·2) in the year preceding. The highest mortality rates were 1·66, ·90, and ·67 in the Deesa, Madras, and Sind districts, as compared with *nil* in the two former and ·66 in the last-named district in the preceding year. The admissions were chiefly for nephritis, 38 cases being recorded, of which 9 proved fatal. Inflammation of bladder caused 37 admissions and one death, and incontinence of urine 29 admissions. The 3 remaining deaths were due to abscess of kidney, calculus in kidney, and suppression of urine. The deaths of the invalids were both caused by Bright's disease.

Diseases of the Generative System.—The admissions for these affections amounted to 5,555, and there was no death, the admission ratio being 78·8 per 1,000, as compared with 77·8 in the previous year and 87·3, the average rate for the preceding ten years. 422·23 men were constantly non-effective, giving a ratio of 5·93, which is ·13 lower than that of the year before and identical with the decennial average. The Nagpur district, which stood second with 204·5 the year before, had the highest admission rate, 303·1 per 1,000, an increase of 98·6; the Narbudda district coming next with 263·7, or 180·6 more than that of the previous year, the Deesa district being third with 220·2, an increase of 7·4. The lowest rate of prevalence was 14·0 in the Belgaum district, an increase of 2·9 on that of the preceding year; the next lowest being 16·3 and 19·2 in the Secunderabad and Rawal Pindi districts, an increase of 6·5 and 10·7 respectively. The largest decrease, 85·9, is observed in the Poona district, which was third highest in the preceding year with 177·1. Simple venereal ulcer accounted for no fewer than 4,733 of the admissions, and among the remainder, the chief causes of sickness were 483 cases of orchitis, 109 of balanitis, and 89 of stricture of urethra.

Diseases of the Organs of Locomotion.—There were 788 admissions and 2 deaths, one being that of an invalid. The admission ratio was 11·2 per 1,000, which is 2·4 and 3·6 higher respectively than in the previous year and than the average rate for the preceding ten years, and the death rate, ·03, is higher than that for 1895 by ·02, but exactly the same as the decennial average ratio. The admission rates of the several districts range from 5·7 in Mandalay to 16·2 in both Sirhind and Bombay; the ratios of 18 districts exceeded those of the previous year, the greatest increase being 9·4 per 1,000 in Sirhind. Of the remaining districts the rate in Narbudda shows the greatest decrease, namely 3·8. Synovitis alone caused 543 admissions. Both the deaths were due to psoas abscess.

Diseases of the Connective Tissue.—There were 1,759 admissions for these diseases, the ratio, 25·0 per 1,000, being higher than in 1895 by ·5 and than the ten years' average rate by 3·4. The three highest admission rates were 38·8, 32·6, and 32·2 in the Bombay, Secunderabad, and Sirhind districts respectively, the first and last being higher than those of the previous year by 5·3 and 3·9, and the second lower by ·3. The three lowest admission rates, 16·3, 17·0, and 17·5 in the Poona, Madras, and Rohilkhand districts, show respectively a decline of 2·3 and an increase of ·2 and 2·0 as compared with the corresponding ratios in the preceding year. There was no mortality under this head.

Diseases of the Skin.—The admissions numbered 4,820, and there was one death (from gangrene). Eczema, ulcers, boils, whitlow, ringworm, and itch were the chief causes of admission, and together accounted for 4,354 cases. The ratio of admission was 68·4 per 1,000, higher by 3·7 than that of the previous year, and fractionally lower than the average rate for the preceding ten years. There were 203·83 men constantly sick, the equivalent ratio per 1,000 being 2·89 as compared with 2·85 both in the year before and the decennial average. The highest admission ratio, 152·8, was in the Sind district, which stood second in 1895 with 118·3, the next being 149·1 and 125·8 in the Mandalay and Deesa districts, a rise of 46·7 and 14·7 respectively as compared with the year before. The lowest ratios were 35·4 in the Quetta, 13·0 less than in 1895, 40·2 in the Southern, a decline of 15·0, and 40·8 in the Poona district, an increase of 4·4.

Poisons caused 34 admissions and 8 deaths, as compared with 28 and 7 in 1895. Of the admissions 6 were for wounds caused by dog bites, 3 by fish,

India.

2 each by snake and scorpion, and 1 by venomous animal. 6 were for wounds due to subcutaneous injection of cholera antitoxine, 2 each to vegetable and mineral substances, and one to morbid secretions; 3 admissions were due to partaking of decayed and diseased meat, 4 were caused by taking various poisons (iodine, oxalic acid, carbolic acid, and alcohol), and one each was due to mercurial inflammation of gums and chloroform vapour. There were two deaths from alcoholic poisoning (both out of hospital), 3 from decayed and diseased meat, 2 from snake bite, and 1 from chloroform vapour.

Injuries.—The admission rate was 105·2 and the death rate 1·58 per 1,000, as compared with 99·7 and 1·75 in the previous year, and with 107·6 and 2·18, the corresponding average ratios for the preceding ten years. The average number constantly sick was 336·96, equal to a ratio of 4·78, which is higher than in 1895 by ·20 and than the decennial average rate by ·02. The number of admissions for general injuries was 288 and the deaths amounted to 70, against 266 and 92 in the year before. The admissions included 214 cases of heat apoplexy, 51 of sunstroke, 9 of multiple injury, 7 of burns and scalds, 3 of lightning stroke, 3 of heat stroke, and one of asphyxia from submersion. Of the cases of heat apoplexy 7 occurred in Mandalay, 3 on the 20th and 4 on the 21st May; all recovered. The men were treated in the upper verandah of the north side of the hospital with wet sheet packing, constant fanning, and an unlimited supply of ice. The medical officer states that there had been a fair amount of breeze blowing up to the 19th May, and its subsidence on the 20th and 21st was marked; he gives the following meteorological observations for these two days:—

Date.	Barometer.	Maximum Thermometer.	Wind Velocity in 24 Hours.
20th May -	29·609	106° F.	125·7
21st „ -	29·630	104·6° F.	183·2

The deaths were 47 from heat apoplexy, 17 from drowning (13 accidental and 4 suicidal), 4 from multiple injury, and 2 from sunstroke. For local injuries there were 7,129 admissions and 41 deaths, two of the latter being those of men who died after leaving the Command, the principal causes of the former being, as usual, contusions, wounds, sprains, and abrasions, which gave an aggregate of 6,514 admissions, among the more important of the remainder being 332 cases of fracture, 92 of dislocation, 61 of burns and scalds, 48 of gunshot wounds, and 36 of concussion of brain. The deaths comprised 23 from gunshot wounds (17 suicidal and 6 accidental), 10 from fractures (one homicidal from fracture of skull, the result of severe blows with heavy sticks inflicted by Somali camp followers), 2 from wounds (1 homicidal from wounds of chest, said to have been inflicted by a comrade with a knife), and one each from rupture of artery, rupture and laceration of spleen, compression of brain, and dislocation of spine. The skeleton of a man of the 1st Battalion Northamptonshire Regiment, at Secunderabad, was found in the jungle; cause of death unknown. Of the deaths out of the Command one is returned as due to fracture, and in the other case the man committed suicide on furlough by shooting himself while in a state of temporary insanity. No motive for the act is recorded.

There were 22 cases of suicide in India as compared with 11 in 1895; 17 were due to gunshot wounds, 4 to drowning, and one to wound of throat. The following are recorded as "presumed motives":—Money troubles in two cases, alcoholic excesses in two cases, and waiting trial by court-martial, family affairs, drink and money troubles, and debilitated health and excessive heat, one case each. In the remainder no motive could be assigned, and in 18 cases the verdict was that the acts were committed while temporarily insane. One of the men was 20 years of age, two 21, four 22, two 23, three 24, two 25, one 26, one 27, one 30, one 33, two 34, one 35, and one 42. Two were of 2 years, two of 3, two of 4, three of 5, five of 6, one each of 7, 8, and 11 years, four of 15, and one of 25 years' service.

There were also 10 cases of self-inflicted injuries or attempts at suicide, of which 8 were cases of wound of throat and neck inflicted with razors, &c., and 2 of gunshot wound of face and neck. In three cases the attempt was induced by drink, one was attributed to domestic trouble and alcoholism, one to pain while suffering from fever, and one to depression from excessive heat of weather; one man was kept under observation for insanity, and in the remaining three cases no motive or cause could be discovered.

Four hundred and eighty-six operations are recorded for the year, of which 463 were primary and 23 secondary, death followed 46 of the former and 8 of the latter. Amputation of the leg in a case of compound fracture and one of the ankle-joint for necrosis of bone were successfully performed. Record of successful amputation of toes for various causes in 18 cases, of the thumb in a case of compound fracture and of a wounded finger is also made. Death followed after amputation of forearm in a case of gunshot wound and after amputation of leg in a case of gangrene and of compound fracture. Amputation at middle third of thigh for compound fracture and lower third of thigh for gangrene and of toe for contraction of tendons, failed; one man was invalided after amputation of leg for compound fracture. Excision, enucleation, and removal of the eyeball for various causes in 9 cases were successful, and in a case of fracture of vault of skull the man recovered after raising of depressed bone. Of 57 cases of hepatic abscess operated on, 36 ended fatally. Of these 57 cases, 16 (12 fatal) were treated by incision and drainage; 12 (9 fatal) by aspiration, incision, and drainage; 10 (4 fatal) by incision; 6 (2 fatal) by aspiration and free incision; 5 (3 fatal) by incision with resection of ribs; 3 (2 fatal) by aspiration; 2 fatal cases by tapping, 2, also fatal, by exploration, and one case by evacuation (recovered). In a case of tubercle of liver exploration failed. Of the other operations succcessful removal of lymphatic glands in 82 cases of inflammation and 6 of suppuration, and 85 cases of circumcision for various causes may be mentioned.

Invaliding.—The number of men sent home as invalids was 1,966, being in the ratio of 27·89 per 1,000, which is higher by 3·55 than that of the preceding year, and by 3·38 than the decennial average. Taking the invaliding in the different arms of the service as shown in Abstract XXVI., it is found that the invaliding ratio in the Cavalry was 22·95, an increase of ·89 over that of 1895, in the Artillery 31·33, or only ·01 more than in the year before, and in the Infantry 28·99, 5·14 higher than in the previous year.

Tables showing the influence of age and length of service in the country, on sickness, mortality, and invaliding, have been already given, and it will be observed that the invaliding rate was highest, 46·63 per 1,000, among men over 40 years of age (who also had the highest rate in 1895, namely, 29·93), and the lowest, as is usual, in men under 20 years. Men of between 20 and 25 years (who stood third with 29·05 in the year before) came second with 32·61, then those between 25 and 30 years with 25·27; in men between 30 and 35 and 35 and 40 years the ratios were 18·55 and 18·08 respectively. In comparison with the ratios for the preceding year those for the year under report have increased by 16·70 among men of over 40 years, by 5·47 among men between 25 and 30 years of age, by 3·56 among those between 20 and 25 years, and 1·39 among men between 30 and 35 years of age, while decrease is observed among those in the other age-groups, the decline being 11·27 and ·36 among men between 35 and 40 and those under 20 years of age respectively. As regards the influence of length of service in the country, the highest invaliding ratio, 40·03 per 1,000, again occurred among men in their second year, as compared with 28·63 in 1895; the next highest ratios were 28·27 and 27·21 among men in their third and fourth years, who had the third and second highest rates respectively in the year before; the fourth ratio, 25·46, and the fifth, 23·78, occurred among men in their fifth year and between 5 and 10 years of service in India respectively; next below came 23·73 among those with less than one year's Indian service, and the lowest of all, 22·72, among men of over 10 years' service. As compared with the ratios of the previous year, those of men in their fourth year and over 10 years' of service show a decrease of ·25 and ·46 respectively, while all the others are higher, the increases being 11·40 among men in their second year's service, 4·76 among those with less than one year's service, 2·67 among those

India.

of between 5 and 10 years, 1·60 among those in their third year, and a fractional increase of ·42 among men in their fifth year of service in India.

The principal causes of invaliding were 448 cases of secondary syphilis (against 321 in 1895) being in the ratio of 6·36 per 1,000; 185 of debility, a ratio of 2·62; 158 of diseases of the circulatory system (including 76 of valvular disease of the heart, 58 of palpitation, and 8 of varix), giving a ratio of 2·24; 141 of tubercular diseases, a ratio of 2·00; 136 of malarial fever, or a ratio of 1·93; 126 of diseases of the digestive system (including 34 of hepatitis, 21 of hepatic abscess, and 20 of hernia), giving a ratio of 1·79; 81 of dysentery, or a ratio of 1·15; 144 of nervous diseases, or 2·04, including 74 of mental disease, or 1·05; 73 of diseases of other organs of special sense (including 41 of perforation of membrana tympani, 11 of inflammation of middle ear, and 10 of deafness), giving a ratio of 1·04; 73 of diseases of the organs of locomotion (including 25 of synovitis and 14 of flat foot), or a ratio of 1·04; 72 cases of injuries (including 22 of fractures, 19 of wounds, of which 9 were due to gunshot, and 12 of heat apoplexy), giving a ratio of 1·02; 50 of rheumatism, or ·71; 50 of other diseases of Group D., which include 22 of anæmia, and 21 of scrofula, giving a ratio of ·71; 42 of diseases of the eye, including 10 of myopia, or ·60; and 36 of enteric fever, a ratio of ·51 per 1,000 respectively. Compared with the corresponding ratios of the previous year and the average of the preceding ten years, an increase of 1·66 and 3·57 respectively is noted under secondary syphilis; of ·73 and ·62 under tubercular diseases; of ·43 and ·12 under dysentery; of ·50 and ·21 under diseases of the other organs of special sense; of ·44 and ·33 under diseases of the organs of locomotion; of ·15 and ·04 under eye diseases, and of ·03 and ·26 under enteric fever. The ratio for debility was ·13 higher than in 1895, but ·65 lower than the decennial average; for diseases of the circulatory system, ·24 higher and ·47 lower in the two comparisons; for diseases of the digestive system, ·22 more and ·20 less respectively; for diseases of the nervous system, ·42 above and ·23 below respectively that of the year before and decennial average, and for injuries, ·03 higher and ·02 lower respectively. For malarial fevers the ratio was 1·29 less than in 1895, but ·03 more than the ten years' average, and that for other diseases of Group D., ·23 lower and ·06 higher respectively in the two comparisons. Decrease of invaliding ratio occurred under rheumatism, of ·12 and ·25 respectively as compared with the corresponding ratios in 1895 and with the decennial average.

There were 880 men discharged the service as medically unfit, equal to a ratio of 12·48 per 1,000, which is above the corresponding rate for the previous year by ·47, but below the decennial average rate by ·61. The principal disabilities necessitating discharge were, dysentery 8 cases, or ·12 per 1,000; malarial fevers 23, or ·33; secondary syphilis 134, or 1·90; debility 34, or ·48; rheumatism 30, or ·43; tubercular diseases 116, or 1·64; nervous affections 100, or 1·41, including 58 cases of mental disorder, or a ratio of ·82 per 1,000; ophthalmic diseases 33, or ·47; diseases of other organs of special sense 52, or ·74 per 1,000; diseases of the circulatory system 23 cases, or 1·74 per 1,000; diseases of the digestive system 47, or ·66; diseases of the organs of locomotion 44, or ·62; and injuries 37 cases, or ·53 per 1,000. Compared with corresponding ratios in the preceding year an increase is observed principally in the ratios for tubercular diseases (·60), diseases of other organs of special sense (·18), secondary syphilis (·16), and diseases of the organs of locomotion (·15); while among ratios which have declined are those for malarial fevers (·25), nervous diseases (·24), debility (·22), and injuries (·11).

Officers.—The average strength of officers for the year was 1,999, the number of attacks of illness amounted to 1,827, the number of deaths to 35, and 126 officers were invalided to England. The ratio of sickness was 914·0 per 1,000, that of death 17·51; and that of invaliding 63·03, which, compared with the corresponding ratios in the previous year, are higher by 90·2, 4·75, and 6·08 respectively. Of *eruptive fevers* there were 28 cases, namely, 11 of small-pox, 6 of cow-pox, 5 of measles, 4 of dengue, and 2 of epidemic rose-rash. In 1895 there were 7 cases of small-pox. 62 cases of *enteric fever* occurred during the year with 14 deaths, as compared with 49 and 12 in the year before; 15 officers were invalided to England on this account and 15 remained under treatment at the end of the year. The ratio of attacks to strength was 31·0 per 1,000 as compared with 24·1 in 1895, and with a ratio of 25·5 per 1,000 among non-commissioned officers and men during the year under report.

India.

while the ratio of deaths was 7·00 as compared with 5·89 in the preceding year, and 6·31, the death rate of the non-commissioned officers and men. The per-centage of mortality to attack was 22·6 as compared with 24·5 in the previous year and 24·8 among the non-commissioned officers and men. The cases were distributed over 38 stations, namely, 6 cases with 3 deaths at Poona; 2 and 2 deaths at Jhansi; 8 and 1 death at Quetta; 2 and 1 death each at Ranikhet, Peshawar, Wellington, and Bungalore; one admission and one death each at Lucknow, Umballa, and Bhamo, and one death at Simla, the officer having been on leave. There were 3 non-fatal cases each at Meerut and Kirkee, 2 each at Agra, Rawal Pindi, Nowshera, and Mhow, one each at Allahabad, Cawnpore, Bareilly, Shahjahanpur, Muttra, Dagshai, Jullunder, Ferozepore, Dalhousie, Sialkot, Murree, Cherat, Secunderabad, Rangoon, Nasirabad, Neemuch, Deolali, Khandalla, Aden, Hyderabad, and Kamptee. *Other continued fevers* gave a ratio of 53·0, being an increase of 3·9 on that of the preceding year. There were 4 cases of *cholera*, 3 of which proved fatal, against *nil* in 1895. *Dysentery* caused 65 cases of illness, equal to a ratio of 32·5, more by 1·6 than in the preceding year; but there was no death from this disease. *Influenza* contributed 71 cases, against 35 in the year before, and *malarial fevers*, including 354 cases of ague, 81 of remittent fever, and 7 of malarial cachexia, gave a ratio of 221·1 per 1,000, being a decrease of 12·1 from that of the preceding year; there was a death from ague and one from remittent fever. *Venereal diseases* furnished a ratio of 14·5, which is a decrease of 3·7 from the previous year's rate, while *debility* and *rheumatic affections* gave ratios of 16·0 and 15·5, lower by 1·2 and 1·7 respectively than in 1895. There were 2 cases each of *tubercle* of lung and anæmia, one of scrofula and a fatal case of carcinoma (scirrhus of liver). *Diseases of the nervous system* furnished 17 cases, being in the ratio of 8·5 as compared with 6·9 in the preceding year; the cases included 6 of neuralgia, 3 of vertigo, 2 each of neuritis and paralysis, and one each of hemiplegia, epilepsy, mania, and dementia. For *diseases of the eye* there were 24 cases, including 14 of conjunctivitis, and giving a ratio of 12·0, an increase of 1·7 on that of the preceding year. 3 cases each were due to *diseases of the ear* and of the *circulatory system*. Two of the latter proved fatal, as also a case of syncope, the officer dying while absent from his corps. 67 cases were due to *diseases of the respiratory system*, 47 of which were cases of bronchitis, 9 of pneumonia, 5 of laryngitis, 3 of pleurisy, 2 of spasmodic asthma, and one of passive congestion of lungs, the ratio, 33·5 per 1,000, being higher by 2·6 than that of the preceding year. *Diseases of the digestive system* furnished a ratio of 128·1 per 1,000, which is higher than that of 1895 by 19·6. Diarrhœa, hepatic and throat affections were the principal causes of illness, the first giving 69 cases, the second 66, and the third 51 cases; 4 cases of abscess of liver (2 associated with dysentery) proved fatal. There were 28 cases of affections of the *lymph glands*, 47 of the *organs of locomotion* (including 35 of synovitis), and 55 of *diseases of the connective tissue*. The ratio for *diseases of the skin*, 51·0, and that for *injuries*, 149·6 per 1,000, are higher by 16·2 and 6·3 respectively than in the year before. There were 13 cases of concussion of brain, and one each of sunstroke and heat apoplexy. Of 4 cases of fracture of skull 2 proved fatal, and 2 cases of gunshot wound also proved fatal, one being a case of murder and the other a case of suicide, the officer having shot himself whilst suffering from temporary insanity, presumed motive being "syphilophobia." The causes of invaliding were debility 22 cases, diseases of the digestive system 16 (including 10 of hepatic affections), enteric fever and dysentery 15 each, malarial fevers 13, nervous diseases 6, diseases of the respiratory system and of the organs of locomotion 5 each, secondary syphilis 4, skin diseases and tubercle of lung 3 each, simple continued fever, keratitis, chronic nephritis, poisoned wound by rabid animal, wounds and contusions 2 each, and rheumatism, inflammation of lymph glands, orchitis, poisoned wound from dog bite, heat apoplexy, dislocation and fracture of skull, one case each.

Women.—The average strength of women was 3,254; there were 2,626 cases of sickness and 60 deaths. The admission rate was 807·0 per 1,000, and that of mortality 18·44, the former being 2·7 and the latter ·59 higher than the corresponding rates of the previous year. There were 60 cases of and 2 deaths from eruptive fevers, 53 (2 fatal) being of small-pox, 3 of

India. chicken-pox, 2 of epidemic rose-rash, and one each of scarlet fever and measles; in 1895 there were 13 cases, 3 fatal, of small-pox. For enteric fever there were 27 admissions and 11 deaths, against 31 and 8 in the previous year; the admission rate, 8·3, was 1·4 lower than in the year before, and the death rate, 3·38, higher by ·88. Of the cases, 5 with 2 deaths occurred at Mhow, 3 fatal cases at Rawal Pindi, 2 cases and 1 death each at Lucknow, Jubbulpore, Meerut, and Secunderabad, 1 fatal case each at Allahabad and Muttra, 2 admissions at Peshawar, and one admission each at Barrackpore, Ranikhet, Sialkot, Campbellpore, Cherat, Shwebo, and Quetta. Simple continued fever caused 60 admissions, being in the ratio of 18·4, which is an increase of 4·9 on that of the preceding year. There was no case of cholera; in 1895 there were 2 fatal cases. Dysentery furnished 59 admissions, equal to a ratio of 18·1 as compared with 23·5 in the previous year; there was one death from this disease. There were 30 cases of influenza against 14 in the year before. Of 446 cases of malarial fever, 397 were due to ague, 34 to remittent fever, and 15 to malarial cachexia, the ratio of admission, 137·1, being lower than the previous year's rate by 25·1; there were 2 deaths from remittent fever and 1 from ague. Under septic diseases are recorded 5 cases of puerperal septicæmia, 4 of which proved fatal, 2 admissions for erysipelas, and 1 fatal case each of pyæmia and septicæmia. 834 admissions are recorded for debility, equal to a ratio of 256·3, an increase of 25·6 on the rate of the year before, while for rheumatic affections there were 33 admissions, including one case of rheumatic fever, the ratio, 10·1, showing a decrease of 3·4. There were 14 admissions and 4 deaths for tubercular disease of the lungs, against 19 with 5 deaths in the previous year. Anæmia gave 73 admissions, or a ratio of 22·4 against 40·7 in 1895; no death occurred from this disease. There were 3 admissions for carcinomatous tumours with two deaths. Under local diseases those of the nervous system furnished 61 cases, against 49 in the preceding year, comprising 19 of hysteria, 18 of neuralgia, 3 each of neuritis and epilepsy, 2 each of hemiplegia, eclampsia, vertigo, and melancholia, and one each of inflammation of membranes of brain and spinal cord, inflammation of cerebral membranes, sclerosis of posterior columns, paralysis, megrim, tetanus, hysterio-epilepsy, insanity, mania, and dementia; 6 deaths occurred, as compared with 3 in 1895, namely, one each from inflammation of membranes of brain and spinal cord, inflammation of cerebral membranes, sclerosis of posterior columns, paralysis, tetanus, and eclampsia. Of 34 cases of ophthalmic disease, 31 were due to conjunctivitis. Diseases of the circulatory system gave 17 admissions and 4 deaths, as compared with 19 cases and 3 deaths in the year before. 7 of the admissions, 2 fatal, were for valvular disease of heart, and there was a death each from fatty degeneration of the heart and thrombosis of artery. Diseases of the respiratory system with 90 admissions and 3 deaths gave an admission rate of 27·7 and a mortality rate of ·92 per 1,000, against 26·3 and 1·57 respectively in the preceding year. There were 69 cases of bronchitis, 7 cases of pneumonia with 2 deaths, 5 of pleurisy with 1 death, 5 cases of spasmodic asthma, 3 of laryngitis, and one of chronic pneumonic phthisis. Diseases of the digestive system accounted for 313 admissions and 9 deaths, being in the ratio of 96·2 and 2·77 per 1,000, the former lower by 1·5 and the latter higher by 1·20 than the corresponding ratios for 1895. The principal causes of admission were dyspepsia 82 cases, affections of the mouth and throat 63, diarrhœa 58, and hepatic disorders 33, 3 of the deaths being due to peritonitis and one each to abscess of liver, cirrhosis of liver, hepatitis, diarrhœa, hernia, and inflammation of intestines. There were 288 cases and one death recorded under diseases of the generative system, the ratios being respectively 88·5 and ·31 per 1,000, the former higher by 5·8 and the latter lower by 1·26 than in the preceding year. The causes of admissions were, as usual, numerous, the largest number of cases occurring under abortion, 76, menorrhagia 30, and abscess of breast 18. The death was due to metritis. Of the cases returned under the remaining classes of disease may be mentioned 6 fatal cases of heat apoplexy.

Children.—The average strength was 5,790, the number admitted 3,321 and the deaths 264. The ratio of admissions, therefore, was 573·6, and that of mortality 45·60 per 1,000, the former lower by 24·9 and the latter higher by 4·36 than the corresponding ratios in the preceding year. Eruptive fevers caused 344 admissions and 10 deaths, as compared with 208 admissions and

7 deaths in 1895; the ratio of admission was 59·4 and that of mortality 1·73, being 22·9 and ·50 higher than the corresponding ratios of the previous year; 240 of the cases with 7 deaths were due to measles, 19 with 3 deaths to small-pox, 60 cases to chicken-pox, 18 to epidemic rose-rash, 6 to scarlet fever, and 1 to cow-pox. There were 44 cases of whooping-cough with 1 death, against 64 with 2 deaths in the previous year; 5 admissions and 3 deaths from diphtheria, against 3 and 2 the year before; 4 cases of mumps and 10 of influenza, against 9 admissions and 1 death for mumps and 15 admissions for influenza in the preceding year. Enteric fever caused 37 admissions and 5 deaths, as compared with 29 and 2 in the previous year; at Secunderabad there were 4 cases and 2 deaths, Bangalore 3 and 2, Allahabad 2 and 1; 6 cases at Agra, 5 at Cherat, 4 at Benares, 2 at Rawal Pindi, and one each at Dum Dum, Chakrata, Umballa, Kasauli, Sialkot, Peshawar, Nowshera, Shwebo, Mhow, Deesa, and Quetta. Simple continued fever furnished 162 admissions and 4 deaths, against 152 cases and 2 deaths in 1895. There was no case of cholera; in the previous year there were 3 fatal cases. For dysentery there were 77 admissions and 12 deaths, against 81 and 9 in the previous year. Malarial fevers gave an admission rate of 101·7 and a death rate of 2·94 per 1,000, being lower by 26·9 and 1·10 respectively than in the preceding year. The cases were 520 of ague with 7 deaths, 56 of remittent fever with 10 deaths, and 13 cases of malarial cachexia. Erysipelas accounted for 2 admissions and 1 death, pyæmia for 1 fatal case, congenital syphilis for 5, 1 being fatal, and hydrophobia for 1 fatal case, while parasitic diseases furnished 34 cases, against 51 in 1895. Under developmental diseases 288 cases and 37 deaths are returned, against 268 and 35 in the preceding year, 24 of the deaths being recorded under immaturity at birth and 12 under debility. As to the remaining admissions under general diseases there were 15 cases of tubercular disease with 6 deaths, 27 of anæmia, 4 of rickets, 1 fatal, 10 of rheumatism, 2 of scrofula, and 1 of fibroma. Among local diseases, affections of the nervous system are found to have caused 73 admissions and 44 deaths, as compared with 52 and 34 respectively in the preceding year, 51 of the admissions with 37 deaths being due to infantile convulsions, 5 (3 fatal) to inflammation of cerebral membranes, 2 each (1 fatal) to inflammation of brain and its membranes and to tetanus, and one each (both fatal) to inflammation of brain and spinal cord and to chronic hydrocephalus. Diseases of the eye were in the ratio of 28·8 per 1,000, lower than in 1895 by 7·0; of the 167 admissions all but 11 were for conjunctivitis. There were 11 admissions for inflammation of the external meatus, one for ulceration of nose, and one for valvular disease of heart. For diseases of the respiratory system the ratio of admission was 76·5, and that of mortality 4·15 per 1,000 as compared with 87·2 and 3·68 respectively in 1895. Among the 443 cases 406 were cases of bronchitis, 24 of pneumonia, 6 of croup, 4 of laryngitis, 2 of spasmodic asthma, and 1 of empyema; the deaths were 14 from bronchitis, 8 from pneumonia, and 2 from croup. The ratio of admission for digestive disorders was 114·7, as against 105·8 in the year before, the death rate, 15·03, being higher by 2·22. Of the 664 admissions and 87 deaths under this head there were 237 cases of teething with 31 deaths, 236 of diarrhœa with 32 deaths, 60 of inflammation of intestines with 17 deaths, and 24 of sore throat with 2 deaths, the remaining fatal cases being one each of stomatitis, quinsy, jaundice, abscess of liver, and cirrhosis of liver. The only cases that need be mentioned under the remaining classes of disease are 2 deaths each from sunstroke and heat apoplexy, and a death each from burns and scalds, heat-stroke, asphyxia from plugging of air passages with foreign substances, exhaustion, and fracture.

India.

SANITARY CONDITIONS.

Remarks by Surgeon-Major-General A. A. GORE, M.D., Principal Medical Officer, Her Majesty's Forces in India.

The sanitary notes from the Command Principal Medical Officers enter so fully into all questions bearing upon the health of the British soldier in India during 1896 that little remains for me to comment upon.

In the year under review the cholera regulations were carefully revised by the committee appointed on my suggestion, and are now republished.

India. The result of the voluminous discussions in and outside Parliament on venereal diseases ended in the promulgation of the amended Cantonment Act, which gives greater power to local authorities over the prostitute population, but falls short of the registration and periodical examinations which many experienced officers advocated.

The annual cantonment sanitary reports have been remodelled and simplified.

At the onset of the plague outbreak at Bombay a précis of all previous experience connected with the spread and prevention of the disease was forwarded to the Quartermaster-Generals and Lieutenant-Generals of Commands for circulation, and the opinion expressed that, owing to the great care paid to sanitary matters in military cantonments, there was little likelihood of its invading them.

Committees which sat at Rawal Pindi and Mian Mir suggested some improvements in the scale of rations for European and native troops, embodying in them the result of experiences gained during the Chitral, Suakin, and other recent expeditions.

Short rules for preserving of health in India, for the use of soldiers and their families, have been issued to Commands.

A number of Congo stoves have been distributed for trial, and the question of the practicability of the British soldier cooking his food at certain stations is being discussed at headquarters, as well as that of replacing leather receptacles for the distribution of water by galvanised iron buckets and metal pakhals, which are more easily cleaned and less liable to pollution by pathogenic organisms. In the meantime orders have been issued that all mussacks and pakhals in use for the carriage of drinking water are to be specially marked, and that as far as possible these should be provided by the commissariat and not by contractors.

Reports were called for and have been received from medical officers in charge of station hospitals as to the way enteric stools are being sterilised, and the approximate cost in each particular case. These have been summarised with the view of adopting one uniform system, and of obtaining the necessary funds from Government.

As an experimental measure sanction has been obtained for the introduction of the Pasteur-Chamberland filters at Dinapore and Peshawar. At the former station a Larymore's boiler (as used in many Indian jails) was under trial. It was found to be so effective in improving the water supply, and in reducing the number of admissions for diarrhœa, dysentery, and enteric, that it is now authorised for distribution where specially required.

It is a well-known sanitary experience that the destruction of refuse and excreta by fire, or of the specific bacteria by boiling or superheated steam, does away with all danger to health from these organisms when the details are carried out with intelligence and under proper supervision. Incinerators are now on their trial. Of these the "Garlick" is believed to be the most efficient. On the same principle boilers for the disinfection of clothing, &c., are being introduced into station hospitals.

An experimental Government dairy has been established at Umballa under the supervision of Veterinary Major Kemp, R.P., with the view of instructing subordinates in the proper management of kindred institutions, and it is hoped that this will lead to an improvement in regimental dairies now largely in the hands of native contractors. An inspection of the admirably organised dairy at Allahabad, vastly improved, and controlled by the Major-General Commanding, proves conclusively that pure milk and butter can be provided for the troops without difficulty. A grass farm and a piggery are attached. The latter is entirely stocked with English breeds, and all native animals are excluded. It was found that the latter took a much longer time to mature. The hams and bacon are excellent, and the manager is now in England with the view of introducing further improvements. It is wholly self-supporting.

Increasing attention is being paid to the manufacture of aërated waters for the troops, and the cheapening of the supply, so that the soldier may be induced to avoid all native-made drinks. The Government have sanctioned a grant for this purpose on the recommendation of the Lieutenant-General Commanding the Bengal Army.

India.

The introduction of the "Allahabad system" for the disposal of excreta appears to meet with favour upon further trial; it is an improvement on that it is replacing, but no system, however excellent in theory, will continue to be effective unless carried out under intelligent supervision by Europeans. It is very questionable whether any system which disposes of excreta in the immediate vicinity of cantonments can be a good one. The excreta are frequently specifically contaminated by discharges from cases of "ambulant typhoid." These under certain favouring conditions may get into the subsoil water or air, and become inimical to health. When not incinerated all refuse should, in my opinion, be carried some miles in a light tramway to a place set apart, where it might either be utilised for agricultural purposes or prove harmless. This system has been often advocated in respect to hill stations as well as the after destruction by fire, to obviate all danger to the water supply and streams which pass below to other more distant stations.

The dry earth system of conservancy when carried out according to regulation has some advantages; but young soldiers recently arrived in India, not being acquainted with its rationale, rarely comply with the details, and infection is undoubtedly distributed in consequence, by means of flies, dust, or specific emanations from the stools, and more especially where the latrines and cook-houses are in near proximity.

The opinion oftentimes expressed by experienced medical officers that much of the acute specific disease seen in India amongst British soldiers is contracted in the bazars or surrounding insanitary villages is, I think, founded on reason.

With regard to the all-important subject of the introduction of pure water supplies to cantonments and bazars (which means so much in many ways) and that when practicable it should be laid on direct to barracks, cook-houses, hospitals, &c., and that the quantity should be ample and the supply not a double one, is fully appreciated by the Government of India and its military advisers. Several schemes for improved supply are under consideration, and only await bacteriological reports to be proceeded with. Among others sanction has been obtained and the funds provided for those for Subathu and Dagshai, where enteric fever has been especially prevalent. In the meantime all necessary sanitary precautions are being carried out.

The proposal to employ tentatively three sanitary officers specially selected, and with a practical knowledge of bacteriology, has been sanctioned by the Government of India, and now only awaits the approval of the Secretary of State. During the discussions (under the orders of his Excellency the Commander-in-Chief) I directed Surgeon-Major Davies, Army Medical Staff (late Assistant Professor of Hygiene, Army Medical School at Netley), to make certain sanitary and bacteriological examinations on the spot at Subathu and Dagshai. It is only when made in this way by an expert that we can hope to get at the cause of origin of enteric fever in India. His reports on Subathu and Dagshai have been printed; they are the first made on any military cantonment in India, and are of much interest.

The question of a preventative inoculation for typhoid fever by an expert is now being discussed, and will, I hope, shortly be brought to a successful termination, his Excellency the Commander-in-Chief having approved of my recommendation that it should be tried.

The conservancy of camping grounds is an all-important question for troops on the march, but the regulations provide for this being carried out by the local authorities.

Mr. Hankin's many pamphlets and bacteriological experiments have led undoubtedly to a greater attention being paid to minor sanitary details of considerable importance in connexion with cook-houses; officers' and sergeants' messes; the personal cleanliness of native servants; of food supplies; the sterilisation of milk and water; supervision and disinfection of wells, &c. Sir William Jenner, when writing on the treatment of typhoid fever, laid stress upon the importance of attending "to little things." I am certainly of opinion that small sanitary lapses and a want of attention to "sanitary little things" are accountable for much disease in the army, and the greatest

India.]

difference is frequently observable between the health of a station where all officers combine to enforce this attention in an intelligent way, and another where it is not so, and it is not brought home to the soldier how important they are. This is especially noticeable where a regiment has suffered severely from enteric fever, and as an example may be noticed that of Subathu, where the disease was practically stamped out.

Volume VI., Army Regulations, India, has been revised up to date, and awaits early publication. A new Field Medical Service Code has been distributed, and a printed form of weekly sanitary reports for troops on field service brought into use.

The English pattern of first field dressing has been distributed for trial with the view of testing its adaptability to the very varying climates of India.

The field hospitals of the army have been raised from 29½ to 66, and these are now equipped and located, and while I write 32½ are mobilised with the large force being concentrated on the North-Western Frontier.

A report on the working of the medical store depôts has been reviewed by his Excellency the Commander-in-Chief, and certain improvements suggested.

A great number of minor matters have received attention during the year, during which 49,500 papers, returns, and reports have passed the office of the Principal Medical Officer in India.

The increasing prevalence of typhoid fever in India is a subject of much interest, and one which cannot be discussed in a few lines. As a test of sanitary measures by Commands it may not be uninteresting to note in passing the different ratios per 1,000 of strength in the admissions and deaths.

Commands.	Admissions.	Deaths.
Punjab - - - -	25·9	6·11
Bengal - - - -	30·2	7·70
Bombay - - - -	25·5	6·36
Madras - - - -	16·8	4·23

There seems to be no doubt that the ability of the virus to multiply in water and milk is a strong indication that it consists of a living organism, and further epidemiological facts support the view that it is decidedly "facultative," being capable of thriving and multiplying, not only in water and milk, but also in the soil. The rules for its prevention at home are equally applicable to India. A distinguished sanitary authority writes on these :—" The prophylactic " measures against the spread of typhoid fever comprise isolation of the sick, " prompt disinfection and disposal of the discharges, and cleanliness in its " widest sense. The water and food supplied must be carefully guarded " against contamination with the poison, and all decomposing animal matter " and excreta must be removed from the immediate vicinity of dwellings. " The requisite precautions may be summed up as pure air, pure water, " uncontaminated food, and a clear soil."

With regard to the detection of Eberth's bacillus in water, it should not be forgotten that Klein, Frankland, and others consider that this can only be effectively carried out on the spot, or at most within a very few hours, later than which the original conditions are entirely altered, and that not a few drops, but from 1,000 to 2,000 c.c., should be operated upon.

The experiments of Jäger tend to show that a 1 per cent. solution of potassium permanganate is not reliable for the destruction of pathogenic bacteria, which require at least a five per cent. solution of working strength after the organic matter has been oxidised. Water with this quantity of permanganate would be undrinkable. On the other hand, Steinberg lays down that it is safe to say that exposure to a boiling temperature for a minute or two will infallibly destroy all micro-organisms in the absence of spores when moist heat is used, and, according to Miguel, alum, which has been used for centuries for the purification of water, is strongly antiseptic in the proportion of 1 in 222, and others have proved that it has in addition a specific action upon bacteria.

India.

Bengal Command.—The Principal Medical Officer, Surgeon-Major-General T. Walsh, reports as follows :—

Presidency District.—At Fort William the chief causes of sickness were venereal diseases, malarial fevers, and dysentery. The two latter are endemic. The sanitary conditions have been well supervised, and have been generally satisfactory. The defects brought to notice in last year's report, viz., in the water supply, the conservancy arrangements and the Ravelin quarters, still exist. The water from the havildar's tank is a grave source of danger, as it is liable to contamination. During the year under report the cholera microbe was found in it. Careful precautions have been taken to prevent this water being drunk by the men in the garrison, and endeavours are being made to remove the defect. This supply, which is used for flushing and washing purposes, cannot be entirely dispensed with, as the municipality cannot provide the quantity of filtered water required for all purposes. The municipal supply has been remodelled to give 5 gallons per head per diem, and to obviate the defects of the supply being intermittent, an experiment is about to be tried of constructing, near the municipal stand-pipes, cisterns for the storage of an always available supply of pure drinking water. A scheme has been authorised for the establishment of a "pail depôt" in the salient of Clive's Ravelin, which will discharge the fort sewage, liquid and solid, by a sewer running across the "maidan" into the main municipal sewer in Dhurramtollah; ample flushing has been provided for. When the scheme is carried out the present objectionable and offensive method of disposing of the liquid sewage, by allowing it to flow into the last section of the cunette, and thence into the river Hughli, will be done away with. Dum Dum.—Dysentery has been much less severe this year, 30 cases having occurred as against 86 in 1895. The General Officer Commanding remarks :—"A very marked sanitary improvement has been effected at Dum Dum as is "evidenced by the health of the troops. The new drainage scheme is a great "success, the men this year could drill on ground that used to be a pool of "water in the rains." The extension of the cantonment filtered water supply to the musketry range is said to have been very beneficial in keeping down disease; the supply is to be partly extended to some of the more insanitary parts of the municipality. It is proposed to discourage the use of the private latrines in the bazars, which are a sanitary evil, by making it cheaper to resort to the public latrines. The second cinerator, a large "Henry Campion," capable of destroying the filth of 36,000 persons, has been constructed recently, and now that it is working all sewage is destroyed by burning. The condition of the insanitary villages round cantonments was carefully investigated under the orders of the Local Government, and steps are being taken to remedy the existing defects. Barrackpore.—The medical officer in charge writes :—"It is quite certain in the rains the filtering beds at the water-"works are insufficient to filter the turbid water of the River Hughli, the "result has been that the station reservoir may be regarded as a settling "tank;" further, "the construction of the reservoir was undoubtedly "favourable to the growth of micro-organisms (schizo-mycetes, vibrios, oval "cocci and diplococci were found) in the collected sediment." To these causes the prevalence of dysentery was attributed. New filtering beds have been constructed, and the structural defects in the reservoir have been remedied. As to enteric fever, which was unusually prevalent during the year, bacteriological investigations, as far as they were carried out, failed to discover the bacillus in the water supply or in any other substance subjected to examination. The great sanitary defect of this station is its low lying position and its imperfect drainage; these causes account for the constant prevalence of malarial fevers. There can hardly be any doubt that were the drainage improved the sickness due to malaria would be lessened considerably. From the engineers' point of view, to remedy the existing conditions, a scheme of drainage to be efficient would have to be extensive, and the cost such as to be prohibitive. The subject continues to receive attention. The erection of a new hospital of the standard plan to replace the present building, *India.* which is an old one, has been sanctioned. Darjeeling.—The medical officer in charge is of opinion that men with organic diseases of the liver and other organs, rheumatism and functional diseases of the heart, are unsuitable for the hills, as they suffer very much on first arrival and only regain their strength after a considerable residence, if at all, and states as his experience that many men on first arrival suffer much from ague, which appears to be due to the sudden change to a cold hill climate awakening the malarial poison lying dormant in the system. There is no source of malaria in the neighbourhood, the water supply is good, ample, and well protected, and the general sanitary condition of the station has been satisfactory. Enteric fever was conspicuous by its absence. Funds have been sanctioned for properly constructed dhobies' (washermen's) tanks and drying sheds, which are urgently wanted for Lebong, Kalapahar, and Jalapahar. Plans and estimates for a Garlick cinerator for the Jalapahar cantonment have been submitted for final approval; when sanctioned and completed, the sewage which is buried, will be burned, as is done at present at Lebong. A slight want of ventilation in the urinaries at Kalapahar and Lebong, some crowding in barracks, the need for open channels around each bungalow to receive and carry off the rain water from the roofs, and the reported unsafety of the site of No. 16 hospital block, have been brought to the notice of the local authorities, in view to steps being taken to remedy or remove the defects.

Allahabad District.—Allahabad.—The year was remarkable for the very high temperature maintained throughout the dry season and the abnormally small rainfall, the lowest on record for 19 years back. Contrasted with 1895, the year may be pronounced very unhealthy. Enteric fever broke out in epidemic form in spring (February to April) and again in December; on both occasions the filter beds of the municipal water supply were found to be infected with the enteric microbe. The medical officer in charge states that every sanitary precaution (*e.g.*, boiling drinking water, the use of potassium permanganate, &c.) was adopted, but of these placing the city and bazars out of bounds seemed to prove the most efficacious in checking the disease. The water supply is from the municipal waterworks, and is as a rule of good quality, though liable to contamination, as instanced above. The conservancy arrangements are excellent; twenty acres of land are manured with the station sewage. There are several very objectionable collections of native houses in the civil lines and Cannington, about one or one and a half miles from barracks; these are a menace to the health of the garrison. The bed of the River Ganges must always be a source of malaria, except when the river is running full. Fort Allahabad.—The water supply is now laid on direct from the municipal waterworks, and is reported good and abundant. Dinapore.—The water supply is from wells, and is abundant and of fair quality. Throughout the year the drinking water has been boiled. The medical officer in charge states:—" The effect of boiling the drinking water has been very " remarkable in checking the number of admissions of enteric fever and " dysentery. After boiling the water a heavy sediment is deposited, consisting " of carbonates of lime, magnesia, and iron and sand. This in the unboiled " state has in all probability the effect of irritating the bowels." During April all the wells in cantonments were disinfected with potassium permanganate, and the cisterns in which the drinking water, after being boiled, is kept, are cleaned out once a week with a solution of potassium permanganate. Recently an estimate for the provision of a Pasteur-Chamberland system of water filtration for the cantonment has been prepared and submitted for sanction. The barracks for the wing of British infantry are being remodelled. The district authorities recommend the erection of a cinerator for the disposal of the night-soil, as the ground beyond cantonment limits, in which the night-soil is usually buried, is flooded or cannot be got at during the rains. Benares.—The period of prevalence of enteric fever was from mid March onwards, the most admissions occurring in April and in August. Ague was most prevalent in September, dysentery in September and October. Cholera appeared in epidemic form in March. The cholera microbe was reported as being present in all the wells, hospital wells included, though only two barracks furnished cases. The drinking water of the garrison, until the outbreak of cholera, was derived from wells, since then it has been obtained from the municipal supply, which is filtered. The supply is said to be satisfactory; the water is boiled before use. The bazar water is from wells. *India.* The medical officer in charge is of opinion that at Benares the water plays but a small part, if any, in the production of enteric fever, and that the disease is due either "to contaminated dust or to flies acting as the carriers of the contagion." The question of the reconstruction of the barracks is before Government, and as it is one of most vital and immediate importance, it is hoped that sanction to the estimate and the necessary provision of funds will be obtained for their early commencement and completion. The district Principal Medical Officer states:—"The present barracks are very old and unfit for occupation "for a moment longer than the time required for building new ones."

Oudh District.—Lucknow.—The water supply is a pipe service from the Lucknow waterworks, which are situated beyond the city, and are under the control of the municipality. The water, which is derived from the River Goomti, passes through a succession of filter beds, and has always been found of marked purity chemically. In September and again in December the Government bacteriologist reported that water taken direct from the pipes contained the enteric microbe. In reference to this the medical officer in charge notes that he has not found the presence or absence of the microbe in the water supply had any influence on the number of cases of enteric fever, which has had for some years a certain season of prevalence. The water has recently been laid on to all the cook-houses in the infantry lines. The supply for the barracks is carried from the standposts in galvanised iron buckets. Since May the whole of the drinking water in the cavalry and infantry lines has been systematically "pinked" with potassium permanganate. The regimental dairies are very carefully looked after and furnish excellent milk and butter to the troops. The butter for the hospital is obtained from the bazar, as the Government rates do not admit of its being purchased from regimental or Government jail dairies; this butter is, owing to its source, objectionable. The district Principal Medical Officer remarks:—"The continued interesting researches of the Govern-"ment bacteriologist show the necessity for the greatest supervision to be "maintained on all supplies of food brought into barracks." The absorption pits in use for waste water and for the overflow from bath-rooms cannot be regarded in any other light but insanitary and a source of danger. The drainage of the station is difficult owing to the flat nature of the site; as funds become available the drainage of the Sadar bazar is rendered more satisfactory. The bazar has a large native population; in some houses it is apparently excessive. Lucknow Military Prison.—The health of the prisoners has been better than in previous years, owing to the excellent water supply (for the second year in existence), and to some extent to a diminution of the number of men taken into prison on account of the building undergoing alterations and repairs. The sanitary conditions have been satisfactory. No cheese manufactured in the country has been supplied to the prisoners for the reason stated in last year's report. Cawnpore.—The general health of the troops, owing to venereal disease, has been bad. There was a marked increase in the number of cases of dysentery (44 in 1896, 10 in 1895). The cause of this prevalence was not traced to any insanitary defect. On the other hand, the number of cases of malarial fevers was less than in former years, owing probably to the small amount of rain. The water supply is derived from wells properly covered, and with pumps placed in the shafts, and is good and abundant. Schemes for a pipe water supply to, and for the better drainage of, cantonments, as well as for the demolition of certain insanitary native settlements in cantonments, have been recommended and are now receiving due attention. The hospital accommodation was again insufficient, and had to be supplemented by the misappropriation of No. 8 married quarters, infantry lines. The night-soil is disposed of on the Allahabad system; about five acres of cantonment land are thus manured and then cultivated. Sitapur.—Owing to the year being very dry malarial fevers were not so common as usual, especially in August and September. The waste water from the lavatories is run by surface drains to hedges or grass plots; a defect in the fall of the drains is to be corrected. No other insanitary condition was reported. The new hospital has been completed and is satisfactory in all respects. The water supply has been abundant and of good quality. The system of conservancy works well, the greater part of the sewage is burned in the Garlick-Christiansen cinerator, the remainder, chiefly the liquid portion, is buried in trenches. Fatehgarh.—

India.

The medical officer in charge writes:—"Venereal diseases were prevalent during "the year. An epidemic of enteric fever occurred during the early part of "the year (February to April) and was traced to water taken from Jacob's well "in the fort, a specimen of the water having been sent to the Chemical Examiner, "North Western Provinces, who detected the enteric microbe in it. The well "was thoroughly cleaned and treated with potassium permanganate, after "which a second sample of water was sent to the Chemical Examiner, North "Western Provinces, who failed to detect the enteric microbe. Since that "date no other case of enteric fever has occurred in the fort. There were no "cases of cholera, and but few cases of diarrhœa, dysentery, and malarial "fevers of a mild type. The health of the troops on the whole has been "good, and the sanitary condition of the barracks satisfactory." The water supply is from wells, and is good and abundant; it is distributed by bhisties. The waste water from the plunge bath is to be utilised in irrigation. Fyzabad.—The general health of the troops was bad, 44 per cent. of the admissions were for venereal disease; ague and dysentery were more prevalent than usual. The mortality from causes other than cholera was also much in excess of previous years; in 1895, of 19 deaths, 11 were due to cholera and none to enteric fever; in 1896, of 24 deaths, 13 were due to enteric fever and none to cholera. The high mortality is ascribed to the debilitated condition of the men, owing to a long residence in an unhealthy station like Dum Dum, where the regiment had been previously stationed for three years, and where it suffered very much from malarial fever and dysentery. The water supply is from protected wells, and is good and abundant, the only exception was in the bakery well, which had to be closed as the cholera microbe was detected in it. As the bakery itself is regarded as unsuitable, a project for a new bakery on a new site with a good water supply has been put forward. The bread has been good, but the meat is reported to have been at times of very inferior quality. This has been represented to the commissariat department. Alterations to the urinaries throughout the British lines and a conjoint scheme for a pipe water supply to the municipality and the cantonment of Fyzabad are under consideration. Certain minor improvements in connexion with the roadside drains have been carried out. The General Officer Commanding remarks:—"The condition as regards sanitary arrangements at Fyzabad is most satisfactory. The regimental bazar of the British Infantry occupies less space "than it should, and might be regarded on that account as insanitary, but "the houses and alleys are kept particularly clean, and ventilation is good, "and there have up till now been no bad results from the defect." The British troops enjoyed an immunity from cholera, though a few cases occurred in September among the natives in cantonments.

Rohilkhand District.—Bareilly.—The general health of the troops, if veneral disease is excluded, has been good. Enteric fever was more prevalent than in the previous year. Samples of water and of soda-water were sent from time to time during the year to the Government bacteriologist, who reported that he found the enteric microbe in (1) the cement cistern attached to No. 1 well, but not in the well itself; (2) the Royal Artillery well supplying the plunge bath; (3) the Royal Artillery and infantry plunge baths; (4) certain chatties (earthen vessels) in No. 12 barrack, and in the bakery in the Royal Artillery regimental bazar; (5) certain tanks in No. 5 barrack and in cook-houses Nos. 36 and 44. On receipt of the reports of the Government bacteriologist steps were taken to remove or purify the infected water, &c. The cement cistern of No. 1 well was replaced by a galvanized iron tank; the Royal Artillery well supplying the plunge bath and the plunge baths themselves were treated with potassium permanganate; all chatties in barracks were frequently inspected, and if suspected or found in the least degree foul destroyed; while all cisterns or tanks in barracks and cook-houses were washed out twice a week with a strong solution of permanganate of potash. While admitting the possibility of the connexion of some of the cases of enteric fever with the above-mentioned contaminated sources of water supply, the medical officer states:—"In nearly all the cases a history could be traced of "the men having been employed at some duty outside of barracks, such as "signalling, field firing, and musketry, some 10 or 16 days prior to the onset "of the febrile symptoms, a fact which shows the necessity of the men being "supplied with water of known purity." The water supply at Bareilly is from covered and protected wells. The drinking and cooking water for the troops is taken from wells Nos. 1 and 3, and for the hospital from a well at the south-east corner of the main block of the station hospital. Attached to each well is a galvanized iron tank into which the water is pumped; the water is "pinked" with potassium permanganate, and distributed to the cisterns in barracks by kerosine tins. During the hot weather small chatties or ghurrahs (earthen vessels) are kept filled in the barrack rooms. The water of the wells on analysis has been found physically and chemically pure. There is an excellent Government dairy at Bareilly from which milk and butter of good quality are supplied to the hospital and camp, and it is hoped the regiments will in future obtain these supplies from the same source instead of establishing regimental dairies which are not satisfactory in all sanitary respects. The barracks are known as the British Infantry and the Royal Artillery barracks; the former are only constructed to hold seven companies. During November and December there was slight crowding in some of the barracks, but as a rule the cubic space is ample, as the increase in the winter months is met by pitching tents close to each barrack to accommodate the extra men. During the winter concentration of troops from Chaubattia and Ranikhet the extra British infantry regiments present are encamped on suitable sites on the "maidan." At this period the hospital accommodation has also to be amplified; the inner verandahs are utilised, and a section hospital for 100 beds pitched. The centre wards of blocks Nos. 17 and 20, where the inner verandahs have been converted into wards, are in the hot weather close and oppressive in consequence of the obstruction to free ventilation. In the winter the reverse is the case, the outer rooms shutting out the warmth and light of the sun. With the exception of No. 18 barrack, which is a converted married quarter, all the barracks are well lighted and ventilated. The lavatories are being provided with reservoirs and pipes to distribute the water, and thus obviate the fouling of water by the men's basins. The waste water from these lavatories is run into absorption pits, which are a constant source of danger; they are close to wells and cook-houses, and into some when cleaned out urine and excreta were found to have been emptied. In the station hospital absorption pits have been done away with, the waste water being distributed over a small piece of ground close by planted with shrubs. This arrangement could be carried out in barracks. In consequence of the intense heat in July and August parades and guards were done in shirt sleeves. The general sanitary conditions have been satisfactory throughout the year. Some of the sanitary improvements carried out during the year were the following:—Remodelling of cook-houses in the Royal Artillery lines hospital and Outram Institute, remodelling the latrines and lavatories in the infantry lines, providing fire-places in the family barracks in the Royal Artillery and the infantry lines, closing the Roman Catholic Institute in which the kitchens were badly equipped and dirty, abolishing chattie filters in the commissariat bakery, water being supplied direct from the well, and erecting a small brick kitchen for boiling enteric stools. Shahjahanpur.—The general health during the year was very good. The one case of enteric fever admitted was imported, and cholera, though very prevalent and fatal in the district, did not affect the cantonments. The water supply is derived from protected wells, and is good and sufficient. As a prophylactic measure potassium permanganate was added to the wells at frequent intervals during the prevalence of cholera in the district, and all vessels for the storage and carriage of drinking water are regularly washed out with a solution of this salt. The supplies throughout the year have been good. During the winter months tinned meats were issued once a week, and tinned vegetables three times a week. They were good, but were not appreciated by the men, and the greater part was wasted. All the milk was obtained from a missionary dairy situated about two miles from cantonments; the supply was good and sufficient. No natives are allowed to sell any milk in cantonments. The butter was obtained from the same source. The accommodation in the barracks and hospital is insufficient, and has to be supplemented by tents. A certain number of the barracks are temporary buildings, which are described as "single storied, low thatched "huts raised a few inches from the ground; hot in summer and cold in "winter; badly ventilated and faultily constructed." It has been necessary to use some of these temporary barracks as married quarters. These buildings

India.

have been badly reported on, and, though popular with the people living in them, it is hoped they will be removed before long. The question of barrack accommodation is under consideration. The disposal of the night-soil on the Allahabad system is reported to have worked well. Naini Tal.—The general health of the troops has been good. The health of the convalescents on the whole most decidedly improved during their stay at Naini Tal. The climate appears to specially benefit men suffering from debility after long and exhausting illness and from malarial cachexia. Cases of secondary syphilis, in the opinion of the medical officer in charge, do not do well here. There was no unusual sickness in cantonments. Enteric fever furnished two cases, both imported. There were no cases of cholera in cantonments, though the disease prevailed in July and August in the civil station. The sanitary conditions were satisfactory. The water supply is as described in last year's report. All water for drinking purposes is boiled before use. As the lake is liable to contamination, especially in the rains, an extension of the municipal pipe supply (which is pure spring water) to the depôt at Kalikhan is very desirable, and has been recommended. Ranikhet.—The Mint and Chippra springs continue to supply good water, but as the quantity is only sufficient for drinking purposes there is always a danger of this water being mixed with that brought from other sources for ablutionary purposes. The distribution by mule pakhals is also open to objection. A pipe-water supply is under consideration, and new springs are being prospected for with a view to giving the station an ample supply of pure water. The milk supply has generally been satisfactory, though found defective at times owing to failure on the part of the European orderlies to carry out instructions. Some of the old cook-houses are too small, and the flooring of the cook-houses generally and of the sinks connected with the cook-houses in the standing camp need levelling and pointing. The trench system of conservancy is employed; all cook-house refuse, urine, and night-soil are buried; though said to be carefully supervised, the system cannot be regarded as satisfactory. All suspicious refuse in hospital is sterilized by disinfection and heat. Enteric fever was unusually prevalent during the year. The Yorkshire Regiment, which arrived in March from Burma, suffered principally. The disease in many cases is said to have been contracted outside cantonments, either at the rest camps en route to Ranikhet, or in the insanitary villages around Ranikhet, which are frequented by the men when out butterfly catching or shooting. As regards the origin of the disease in cantonments, the Government bacteriologist reported that he found enteric microbes in samples of water from No 10 spring, which is used for washing purposes, and from cisterns in the station hospital cook-house, and in the coffee-shop cook-house, Kompoor barracks. Every sanitary precaution has been adopted, including the pinking of the drinking water with permanganate of potassuim, which, in the opinion of the medical officer in charge, had a very salutary influence in checking the disease. The water supply, the conservancy arrangements, and the general sanitary condition of the rest camps en route to Ranikhet are again being carefully attended to. Chaubuttia.—The general health of the troops throughout the season, excluding cases due to venereal origin, has been very good. There was only one admission for enteric fever, and an entire immunity from cholera, though the latter disease was prevalent in the villages around. The barracks are old and unsuitable for requirements, being constructed of wood generally, and in fair repair only. In some of the subsidiary buildings there is room for improvement in the ventilation. The remarks made in last year's report with reference to the hospital and its accommodation are equally applicable to the year now under report. A new hospital is under consideration; it is to consist of (1) a new double-storied building of stone for 56 men; (2) a separate hospital for women and children, and (3) an infectious disease hospital. The last has been completed and handed over to the medical officer in charge. It comprises two wards, built of stone, for two patients in each ward, and an outbuilding divided into attendants' room and kitchen. The water supply is from the forest spring, and is good and sufficient. All vessels for carriage and storage are carefully cleansed with potassium permanganate. The medical officer advocates a reservoir at the spring and a supply by pipes.

Narbudda District.—Jubbulpore.—The noteworthy feature of the year was the large number of cases of ague, which accounted for rather more than a third of the total admissions, and which left the sufferers in a very anæmic condition, in consequence of which a larger number of men will have to be sent to the hills during the ensuing hot weather. This prevalence, which was most marked from July to December, September and October being the worst months, is probably to be attributed to the high level of the subsoil water, caused by the excessive rainfall and the disuse of the wells. The water supply is from the municipal waterworks, the water is rain water collected in a large reservoir and distributed without filtration by pipes to the barracks and hospital; on analysis it has been found to be quite potable, but on the other hand open to contamination, as shown by the Government bacteriologist. During the prevalence of enteric fever in April and May samples of water from the reservoir and the stand-pipes (as well as from the Macnamara filters) were reported "to contain the enteric bacillus, besides the cholera microbe, in an undeveloped stage"; suspended matter was also present in the supply. Dysentery, as well as enteric fever, prevailed at the time, but no cases of cholera occurred among the troops. "In May sanction was obtained for boiling the "water, besides treatment with potassium permanganate, with the result "(? propter hoc) that enteric fever lessened." The medical officer in charge also adds:—"The practice of boiling the water is continued with, I think, "favourable results, and it would be well to continue the precaution." The hospital accommodation was inadequate, and had to be supplemented by the misappropriation of an adjacent barrack. An increase in the number of hospital buildings, a ward for infectious diseases, an officers' ward and a new family hospital are needed, as the buildings used at present for these several purposes have been found unsuitable. A very insanitary village in cantonments, as well as a small settlement close to the above, exist. It is very desirable these should be removed; as funds become available the superfluous native houses are demolished, and it is hoped that it will be possible to devote a sum every year for this purpose until the work is accomplished. The drainage of the Sadar bazar has been improved. Saugor.—The medical officer in charge remarks:—"During the year there have been a good many admissions for ague "and venereal disease, but apart from these the health of the troops has been "good. Two outbreaks of cholera occurred. The first was due to the "presence of the cholera microbe in the water of the filter well; two cases "occurred, both of which were fatal; the water was boiled and the outbreak "ceased at once. Later in the year two officers were seized with cholera, one "of whom died; the disease was contracted at a dinner at the mess of the "14th Bengal Lancers, and the microbe (cholera) was found in some jharans "(dish-cloths) and in some water in which live fish were kept. The sanitary "condition of the barracks and lines have been very good throughout the year "and no sanitary defects called for representation. The water supply has "been good (with the exception of the instance noted above) and abundant." In the Sadar bazar and native infantry lines, on the other hand, the water supply was very deficient, especially in April, May, and June, owing to the great deficiency in rainfall, two of the existing wells are to be deepened and a new trial shaft is now in process of being sunk in a new locality. The drainage of the Sadar bazar is being improved, and the following works are under consideration:—(1) The introduction of the group system of iron movable latrines in the neighbourhood of officers' houses; (2) the roofing in of the drinking water wells, and (3) construction of water troughs for the washermen. Pachmarhi.—Pachmarhi is malarious, the climate, too, is liable to diurnal variations and sudden alterations of temperature, especially in the autumnal months, which produce chills and induce fresh attacks of malarial fevers and dysentery in convalescents who have previously suffered from these diseases in the plains. The water supply is from wells and is satisfactory. All water for drinking and cooking purposes is taken from a deep well, which was constructed during the year, in a central and convenient situation with regard to the barracks. There has been no crowding, but the authorised cubic space is only obtained by the misappropriation of dining halls as dormitories. The question of increased barrack accommodation is receiving attention in view to obviating the existing defect, which entails discomfort on the men, in that they have to dine in the verandahs, and further have no place in which they can dry their damp clothes and bedding. The rations and other food supplies were of good quality; some difficulty is experienced in procuring green vegetables.

India.

India.

Besides the well already referred to, the following sanitary improvements were carried out during the year:—(1) The conversion of the quartermaster's store-room into a new canteen; (2) the erection of a dairy and station bakery in the depôt lines; and (3) the enlargement of the depôt sergeants' mess. No isolation ward exists in the hospital, and the want of an assistant surgeon's quarters in the hospital compound has been represented; at present the assistant surgeon lives nearly half a mile away. A cinerator has been proposed for the destruction of the night-soil, &c., from the cantonment and the civil lines; the population is increasing and trenching ground at a convenient distance is limited.

Bundelkhand District.—Agra.—The water supply is from the municipal works, and is reported to be good and sufficient; it is, however, liable to contamination; the enteric microbe was found in it in September. The medical officer in charge is of opinion that to this contamination of the water supply must be attributed the great prevalence of enteric fever in August, September, and October. The same officer, with reference to the permanganate of potash treatment of water, observes that it failed entirely to remove the enteric germ, which was found "in a flourishing condition in the pink water in the "receptacles for holding the drinking water, both in hospital and barracks, "although every care was taken, and the permanganate solution introduced "at night to ensure its producing the desired effect." Experiments were made with the micrococcus ghadiallii (this organism is said by Mr. Hankin to be antagonistic to the enteric microbe, and quite harmless to human beings), which was added to the contaminated water supply. The enteric epidemic ceased on the introduction of this treatment, but whether the cessation was a mere coincidence or the result, the medical officer is unable to express an opinion. He further adds that at the time of the micrococcus treatment the water was all boiled, which practice is still continued. The water is being laid on to the cook-houses of all buildings occupied by European troops at Agra. The sand over clay used as flooring of latrines is objectionable on sanitary grounds; absorption must occur; stone flags or hard tiles, well fitting, would be preferable. The General Officer Commanding remarks:— "There are too many bazars and native villages in and near cantonments, and "the bazars are larger and more populous than they ought to be. The "cantonment is well and carefully looked after, and, in spite of all drawbacks, "is not unhealthy. The defect in the water supply is receiving attention." Jhansi.—The medical officer in charge writes:—"The health of the troops "during the year has been very bad, owing to the great prevalence of venereal "disease, which is steadily increasing. The importation of cholera into the "station in March and April, and the prevalence of enteric fever, especially "during the last quarter of the year, have caused an unusually high death "rate. Filters were abolished on 23rd July. Permanganate of potash has "been added to the drinking water since that date, but without any "appreciable benefit. All the drinking water is to be boiled for one month "as an experiment from 1st January 1897. The sanitary condition of the "station is on the whole good, and I am unable to point out any special "defects, but I would again recommend the following sanitary improvements "as likely to improve the health of the troops:—(1) A continuous water "supply laid on to barracks and hospital; (2) all excreta to be destroyed by "fire; and (3) station dairy for the supply of pure milk and butter." The water supply is reported to be of good quality and abundant. With reference to the hospital accommodation the General Officer Commanding writes:— "The newly-built station hospital at Jhansi is found too small for the number "of sick at the station, and the old hospital, which was ordered to be con-"verted into a barrack, on completion of the new one, is still occupied by the "sick, so that some of the troops have to be put under canvas in consequence. "But I find that the total accommodation afforded by these two buildings is "considerably in excess of the accommodation required, as shown by the "returns, and so I have ordered a barrack smaller than the old hospital to be "handed over in lieu of it." This arrangement, if carried out, will cause considerable inconvenience to the sick and their medical attendants. The latrines are being re-modelled, and efforts are being made to establish a system of permanent surface drainage in the Sadar bazar, where it is much needed. Nowgong.—The station has been in a very healthy condition during the year

India.

if an epidemic of cholera, which prevailed among the native population in July and August, be excluded. The disease is said to have been introduced by famine-stricken villagers. Two cases occurred among the British troops. During the epidemic permanganate of potassium was used in the wells, and precautions taken to prevent contamination. The malarial fevers which (with venereal diseases) were the chief cause of sickness, are endemic; the numerous lakes and the cotton soil may be accountable for their prevalence. No sanitary defects were brought to notice, except the scarcity of vegetables at the end of the hot weather, in consequence of which the Royal Artillery suffered from a scorbutic taint, which was successfully removed by the issue of lime-juice. The medical officer advocates the issue of other vegetables, along with potatoes, to the British soldier in India, who, in his opinion, should not be allowed his own discretion in the matter.

Meerut District.—Meerut.—The drainage within cantonments is generally good, though in the European regimental lines there is a want of proper fall. The water supply is from wells, and is reported "sufficient, good, and pro- " tected from pollution. Samples of water from various wells were sent to " the Government bacteriologist at Agra, who in several instances detected the " enteric microbe, and in others the micrococcus ghadiallii, a micro-organism " which is said by Mr. Hankin to have the power of destroying the enteric " microbe. In all cases where the enteric microbe was detected, necessary " steps were at once taken to have the wells cleaned. Boiling of water was " carried out by the Royal West Kent Regiment and by 'N' Battery, Royal " Horse Artillery, and subsequent to the issue of the recommendation " regarding the disinfection of all wells, earthen goblets, &c., by perman- " ganate of potash, they were all saturated with such, and the instructions on " the point carefully carried out." Enteric fever was less prevalent than in previous years and the type less fatal, though the disease was the chief cause of mortality. Besides the infected wells referred to above, the medical officer attributes the origin of the disease in many instances to the bazars, which are largely frequented by the men, and supports his opinion by the facts (1) that " some of the water as well as aërated waters, manufactured in the " bazars and supplied to the Good Templars' hall, and also to a brothel much " visited by the men, were found on examination to contain the enteric " microbe," and (2) that the married families escape. The medical officer further adds, "The disease is not confined to any one corps in particular, it has " its seasons of activity, and notwithstanding the boiling of water and dis- " infection by permanganate of potassium, I am of opinion that until the " whole system of water supply is altered, and there is a direct delivery to all " quarters without the intervention of the bhisties with their mussacks and " buckets, we shall never wholly eradicate the disease at Meerut, though, " with all the precautions as to cleanliness and disinfection now taken, we " may lessen it." A scheme for providing the cantonments with a pipe-water supply from the Ganges Canal in connection with the Meerut city supply has been sanctioned, and the construction of a raised reservoir to hold 3 days' supply for cantonments has been commenced. The overgrown bazar in the centre of cantonments must be a source of danger to the health of the troops. The latrines in the lines of both the British cavalry and infantry are very old: as funds become available they will be remodelled. Ague of ordinary type prevailed: the disease is ascribed to " climate, very many of the men having " contracted the disease at Delhi." Delhi.—The drainage within cantonments is efficient and satisfactory, there are no actual marshes in the vicinity, but the river (Jumna) bed to the east and south-east of cantonments becomes marshy during the rains; the presence of this condition is accountable for the annual prevalence of malarial diseases when the flooded land begins to dry; the defect is irremediable. The prevailing disease as usual was malarial fever, which occurred chiefly during and after the monsoon; owing to the unusually dry year the admission rate was not as high as the average. Quinine was used as a prophylactic for some months with satisfactory results. The section hospital at Hindu Rao's house on the Ridge was opened from 1st August to 15th October for the treatment of malarial cases liable to relapses if kept at the fort, and seemed to have answered its purpose. The water supply from the Delhi waterworks is sufficient and of good quality. There was but one admission for enteric fever, and this occurred after the use of

India. potassium permanganate. The medical efficer in charge remarks:—"It is "evident that the immunity enjoyed from this disease is due to the present "water supply." Muttra.—The year was healthy on the whole, but could not compare with 1895, which was exceptionally so. Venereal disease shows a serious increase, and the type of the disease has been more severe. There were eight sporadic cases of enteric fever for which no cause can be assigned by the medical officer in charge. Two cases of cholera occurred on the 26th and 27th March among the troops, the men were "chums," and lived in No. 2 barrack; a native servant employed in the same barrack was also attacked on the 27th instant. Portions of the stools and vomit of the men were sent to the Government bacteriologist, who reported that he found the cholera germ in the samples. There was cholera in the city and neighbourhood, but the mode of the infection was not traced. The general sanitary condition has been satisfactory, and all defects noticed remedied as far as possible. Beyond the use of permanganate of potash, which is used to cleanse all vessels for the storage and carriage of water, the remarks in last year's report with reference to the water supply stand good. The milk and butter for barracks comes from the regimental dairy, the quality is excellent; these supplies for the hospital are obtained from a contractor whose cows are kept and milked under European supervision. The rations are good and fairly well cooked, native cooks are, however, filthy, and have to be constantly supervised. All extras, as fruits, vegetables, &c., are carefully inspected at the station hospital before being taken round barracks. The four old barracks, which have been condemned as insanitary, are being pulled down and replaced by modern buildings; all the old subsidiary buildings, such as latrines, wash-houses, and kitchens, are also being remodelled. The new barracks and kitchens are satisfactory. The cells are well built and roomy, but, being badly placed, are very hot in the hot weather. In the hospital the requirements referred to last year still exist: one of the two prisoners' wards has been converted into an eye ward; the Military Works Department have been applied to for a stove in each ward as wadded curtains are insufficient to keep out the cold in winter; the lavatories need masonry platforms in place of the old wooden benches now in use. New quarters are to be built shortly for the assistant surgeon, who lives at present in a hired bungalow. The Allahabad system of filth disposal is employed and works satisfactorily. The introduction of movable latrines with galvanised iron screens for the native population in cantonments is a great sanitary improvement. Roorkee.—Enteric fever has caused much less inefficiency than heretofore; of the 5 cases treated, not one can be held to have originated at Roorkee during the year, an immunity that has not been enjoyed for at least 13 years previously, while only one case of cholera (believed to have been imported) occurred, though the disease prevailed all round the neighbourhood. The absence of these diseases is ascribed by the medical officer in charge to the careful attention paid to the drinking water, the mineral waters, the milk, vegetables, and fruit, and the cook-houses and latrines. The drinking water, as well as the water used for making bread and for mineral waters, was boiled; all milk is also boiled before use. A regimental dairy supplies the milk and butter, and a mineral water factory, owned by a native, the mineral waters; both are under European supervision. All fruit and vegetables sold in the lines are daily brought to the station hospital for inspection; care is taken not to pass any unsound or unripe fruit, and when cholera threatened it was recommended that all vegetables should be cooked. In the cook-houses especial care has been taken to keep them clean, keeping out flies, keeping food inside safes, boiling jharans (dish-cloths), and keeping out latrine sweepers. In the Royal Artillery lines the cook-houses and latrines are placed most objectionably near to each other, in some instances within a few yards, while in the assistant surgeon's quarters, No. 5, they are under the same roof. There is distinct risk of infection being carried by flies or by sweepers from latrine to cook-house; on account of the risk arising from the proximity to the cook-house one latrine was closed. The latrines have been kept as clean as possible, some are defective in ventilation. The defects are to be remedied, and when funds become available the installation of an entirely new plant in connexion with the introduction of improved conservancy arrangements will be carried out. Landour.—There were no cases of cholera or of enteric fever. *India.* The general sanitary conditions were satisfactory, excepting certain minor defects connected with the urinals and surface drainage of the regimental institutes, which are to be rectified. The Landour main bazar is said to be overcrowded; it has recently been transferred to, and is now under the control of, the municipality. A certain number of the native huts have been removed, and it is proposed to demolish other native houses near the Government bakery and the butcher's shop. Chakrata.—The water supply is good, but liable to contamination. In samples of drinking water collected in April and in May at the source "C" spring and from a "mussack," a "pakhal," a cookhouse tank, and a barrack filter, the Government bacteriologist reported that he found the enteric microbe or its congeners. It was also present in a spring close to barracks which was not supposed to be used for other than garden purposes. The medical officer attributes some of the cases of enteric fever originating at Chakrata to this source, and is inclined to explain the limited outbreak to the micrococcus ghadiallii, a micro-organism which has also been found in the Chakrata water supply, and which is said by Mr. Hankin to be inimical to the enteric microbe. To remove the enteric microbe from the water supply, "sterilisation was attempted by means of potassium permanganate." A fresh spring is being added to the head works, as there was some deficiency of the supply before the rain broke, and to reduce the chances of pollution the springs are to be fenced in with barbed wire. The milk and butter supply is mainly derived from the surrounding villages and byres, where supervision is impossible; this is objectionable, as the surrounding villages are said to be very insanitary. An increase in the number of cases of rheumatism in the garrison was attributed to the use of khaki instead of serge in the rains; representations were made with favourable results. The accommodation is insufficient, as previously reported; the authorised cubic space in barracks is obtained by utilising the day rooms as dormitories, and in the hospital by misappropriating a barrack and by pitching tents. A small incinerator has been constructed near the station hospital for the destruction of all dejecta from enteric patients. Since last year's report a public larder has been opened in the Sadar bazar, a model bakery is in course of construction, careful rules have been drawn out for the aërated water factories, which are frequently visited, public movable latrines have been extended to officers' quarters, and, where practicable, the group system of latrines has been applied to private houses as well. Sanitary improvements have been carried out in the "dhobies' ghats" and the "dak bungalows" in the vicinity, which are frequented by the men, have also received attention.

The district Principal Medical Officer remarks:—"The arrangements for the "general sanitary condition of the station and for the health of the inhabitants "generally seem to be very complete."

In conclusion, it may be remarked that during the year under report Macnamara filters were abolished throughout the Command, and that potassium permanganate was almost universally employed for purifying wells and receptacles for the distribution and storage of drinking water, &c. as well as for "pinking" the drinking water itself. That this agent is useless in preventing the growth and development of the enteric bacillus would appear to be proved by the facts reported by the medical officer in charge at Agra. Of the several measures which were adopted for sterilising drinking water, in view to the prevention of water-borne diseases, such as cholera and enteric fever, the most efficient was boiling. The Pasteur-Chamberland system of filtration. has not up to date been introduced into any station in the Command.

PUNJAB COMMAND.—The following remarks are made by the Principal Medical Officer, Surgeon-Major-General R. Harvey, M.B., D.S.O., Indian Medical Service.

Questions of sanitation have received much attention.

Water Supply.—The Government of India has adopted the principle of the elimination of the mussack, and the gradual extension of existing water supplies into kitchens, lavatories, barrack-rooms, and hospitals, so that the pure water may be drawn direct from the taps without the intervention of native water-carriers or leather mussacks, and although little has as yet been

India.

done to carry this plan into effect, the use of zinc pails has in many stations been largely substituted for that of mussacks. The danger of mussacks was illustrated during last year at Cherat, where Surgeon-Major Johnson found that water taken from mussacks and pakhals contained three times as much organic matter as it did at its source at Chapri. Nothing more has been heard of the proposal to substitute metal tanks for pakhals, since those tried last year were found to be too heavy. Aluminium has become so much cheaper of late years that I think it might be tried, the tanks being furnished with wicker or leather covers, if necessary, to protect them from injury.

Conservancy.—The latrines for British troops and hospitals have on all occasions been found in the most perfect condition of cleanliness, and considerable improvements have been made at many stations in those for native troops and the bazar population. The Allahabad system for the final disposal of the night-soil has been largely extended, and further observation of it strengthens the conviction that "it is at once the most scientific, "economical, cleanly, and least offensive method of disposing of night-"soil" for stations in the plains. The difficulties attending its introduction have been for the most part overcome, and it is now working thoroughly well at the majority of stations. The problem of conservancy at hill stations has been carefully considered. In them the Allahabad system is impossible, owing to the difficulty of obtaining sufficient land on the hill sides, and different systems are in force at different stations for the disposal of the night-soil. α. What may be called the primitive method, under which there are no arrangements whatever, the men resorting to the hill side. This plan does not apply to any station where there are British troops, but is still in use by the 4th Gurkhas at Bakloh, by the troops in the left infantry lines at Dera Ismail Khan, and by some of those at Dera Ghazi Khan. It was only abandoned at Abbottabad in 1892. β. The system of burial in trenches or pits, the dimensions and situation of these varying with local conditions. Up to a few years ago it was in use at all hill stations, and is still used in many. The situation of the pits was frequently chosen without any reference to their possible effect upon the water supply, and there is reason to believe that much of the former unhealthiness of several hill stations (notably Murree and Dagshai) was due to mistakes of this nature. At present the sites are much more carefully selected and the danger to the water supply has been for the most part averted, but in almost every instance it is impossible to find sufficient land for shallow trenches. and we get a succession of elongated filth-pits in which the night-soil remains festering for months or years. In some stations ground cannot be found for trenches, and the soil is buried in large pits 6 to 8 feet deep. This system can only be justified on the ground that no other is possible, and must in any case be full of danger. γ. Cremation by incinerators.—This plan has been introduced of recent years into a good many stations, especially in the Sirhind district, and is strongly advocated by many. It effectually destroys the night-soil, and is a great improvement on the preceding plan. It has, however, disadvantages of its own. The principle of consuming valuable fuel to destroy valuable manure is a wrong one. The cost is very considerable, and as the incinerators must be placed in or near the station, since everything has to be carried to them by the sweepers, they are, even when well managed, offensive in certain directions of the wind; and when badly managed become intolerable nuisances. At Subathu I noticed a very disagreeable smell in the military prison wafted from the incinerator below it; and two incinerators at the Malakhand and Chakdara respectively have had to be pulled down because of their offensiveness. δ. Wire tramways.—In this system the receptacles containing night-soil are carried down the hill side on a wire revolving round a drum, the empty receptacles being carried up another wire by the extra weight of those descending. The system thus works by gravitation, and the night-soil can be carried down the hill side any distance that may be thought desirable, or till a suitable trenching ground is reached. The first cost is somewhat greater than that of an incinerator; but there are no annual recurring charges, except a trifle for repairs, and it is much cheaper in the end. It removes the night-soil to a safe distance, and causes no nuisance whatever. Sites for such tramways can be found at all hill stations. They are working admirably at Murree, Gharial, Kuldana, and Lower Topa, and in my opinion there can be no doubt that it is the best and most suitable plan for the conservancy of hill stations. Plans are under consideration for extending the system to Dalhousie, Bakloh, and Dharmsala. *India.*

Kitchen Arrangements.—These have been very carefully inspected, and in almost every instance have been found more or less faulty. The new standard plan of kitchen is a good one. End windows are supplied to the range, and they are fitted with meat safes and water tanks, the latter being filled from outside. Large numbers of old pattern kitchens, however, still exist. They are dark, many have have broken floors, and are unprovided with water tanks, the water for cooking purposes being stored in a metal tub and exposed to serious risk of pollution. The cooking is done entirely by natives, many of whom are of low caste and extremely dirty in their habits. Until quite recently the meat has been cut up into rations on chopping blocks placed upon the ground and liable to be contaminated by the sweepings of the kitchen floor, or has been cut up by the cooks seated on the floor and holding the knife between their toes. These defects have almost everywhere been remedied. In almost every instance the supply of dish-cloths is altogether inadequate, and most of those seen were extremely dirty. Mr. Hankin has shown that these dish-cloths may harbour disease germs, and that kitchen water-tubs may convey infection, and there were instances of conveyance of disease by dirty natives. The particular attention of commanding officers has been drawn to this important subject, and much more attention than was formerly the case is now given to the cleanliness of kitchens; but these will, I believe, always be a source of danger so long as the native cooks are retained. I see no reason why British soldiers should not cook their own food, at all events in the hills, and in the plains during the cold weather; and it might even be possible during the summer. It is done throughout the year in the military prisons without bad effect, and though the opinions of commanding officers differ on the point, I think the experiment might be tried. Congo stoves were used for the hospital, and one company of the Rifle Brigade at Kuldana last season, and were a complete success; and the Gordon Highlanders have been doing their own cooking since 1st December 1896, to the entire satisfaction of the commanding officer.

Improved Laundry Arrangements.—The Principal Medical Officer, Lahore district, having pointed out the extremely unsatisfactory nature of the arrangements for washing soldiers' clothes and hospital clothing, I have been endeavouring, in conjunction with him and the district and Command authorities, to secure improvements in this direction, and a new system of dhobis' tanks will, it is believed, be introduced shortly at several stations in the Lahore district. Should the experiment prove successful, efforts will be made to extend the system to other districts. The main principles of the system are to provide separate tanks for the regimental washermen, so that the soldiers' clothes shall not be mixed with foul linen from the bazar; to utilise the existing hospital laundries, and to prevent the washermen from standing in the water in which the clothes are washed.

Miscellaneous.—Attention has also been given to the sanitary condition of dairies, soda-water factories, canteens, commissariat and bazar bakeries, slaughter-houses, &c. As a rule, most of these have been found in good sanitary condition, with the exception of canteen cook-houses, many of which are too small, and most of which were dirty.

Sanitary Improvements.—In addition to those already mentioned, numerous small structural improvements have been effected during the year, particulars of which will be found under their several stations. Arrangements for the temporary improvement of the water supply at Dagshai and Subathu are in progress, and large schemes for a properly protected permanent supply there and at Dharmsala are under consideration. So is the proposal to establish bacteriological laboratories, without which we are so hopelessly handicapped in our fight with enteric fever.

The following statements are taken from the sanitary reports received from the various stations:—

Sirhind District.—Umballa.—The general sanitary condition of the station was satisfactory. The water supply is reported to be good and above suspicion, but the quantity being somewhat deficient the sinking of another well has been sanctioned. All the drinking water was boiled during the year as a

India.

precautionary measure. There was a very considerable falling off in the number of cases of enteric fever, and half the admissions for this disease occurred during November and December, after the arrival of the troops from Subathu and Dagshai, at both of which stations enteric fever was very prevalent during the hot weather. The Allahabad system of disposal of sewage is being worked with very satisfactory results; an incinerator has, however, been used in the camp occupied by the Royal Highlanders, and is reported to have worked well. The hospital accommodation had to be supplemented by the use of tents during the cold weather, but no ill effects resulted. Dagshai.—There were nearly twice as many admissions to hospital for enteric fever as in the previous year. The water supply is derived from two springs in the hill side below the barracks, at distances of 300 and 1,000 feet below the level of the main road. The springs are provided with good reservoirs, and are protected by masonry. It was discovered, however, that trees had driven their roots through the masonry conduit leading to one of the reservoirs, thus allowing free percolation from the surface; several other possible sources of contamination were suggested. The enteric microbe was found in a specimen of water, taken from the lower reservoir in July, as well as in specimens taken from a cook-house tub and a water tank; the addition of permanganate of potash to drinking water, in the manner recommended by Mr. Hankin, was commenced at once, but as this did not appear to check the progress of the disease the water was boiled prior to the addition of the permanganate of potash from 28th August, after which date there was a very marked diminution in the number of admissions to hospital for enteric fever. The use of filters was abolished in May. The officers (with one doubtful exception), the prisoners in the military prison, and the married people enjoyed complete immunity from the disease, though using the same water, milk, and food supplies. Steps have been taken to improve the existing water supply pending the introduction of a new pipe-water supply from an approved source. A specially qualified Royal Engineer officer has been deputed to work out the schemes for improving the water supply both at that station and Subathu. The dairies, two in number, were kept in perfect order, and supplied with all modern appliances; as a precautionary measure all the milk was boiled before being issued to the troops. The cook-houses are mostly of old pattern, and in some cases are too close to the latrines. Three incinerators and two urine shoots were in use for the disposal of all excreta, and worked in a fairly satisfactory manner. An offensive smell from one of the incinerators was complained of, and it was decided to remove it to a more suitable position. As there are many sites available, it was suggested that the excreta should be removed by wire tramways and buried in trenches down the hill side, as being a more satisfactory system of disposal. Subathu.—The general sanitary condition of the station was very satisfactory. There was, however, a very severe epidemic of enteric fever amongst the men of the Black Watch, which regiment arrived in India from the Cape and Mauritius in February 1896, and formed the garrison of Subathu during the summer months; there were in all 109 admissions to hospital for the disease. No cases occurred amongst the officers or married people, though they procured their water and food from the same sources. The main water supply is derived from a spring, situated south-east of the station, about 100 yards below the Kasauli Road, at the bottom of a hill on which the hospital and other habitations are built. The ground surrounding the reservoirs was covered by dense jungle, which afforded facilities for the natives to use the place as a latrine. A surface drain, carrying surface washings from the hill above, was found to cross the masonry which was supposed to protect No. 1 spring; these defects were quickly remedied, but the enteric microbe was found in samples of water taken from the reservoir in connexion with this spring in August and September. The water in this upper reservoir was noticed to be muddy on several occasions after heavy rain, which was thought to be indicative of surface pollution. A proposal was made for the installation of Pasteur-Chamberland filters, but was rejected. Steps have been taken for the improvement of the existing water supply pending the introduction of a new pipe-water supply from an approved source, the work in connexion with which is to be commenced without delay. It was found that the mussacks and pakhals, used by the natives for carrying water about barracks, were also used for carrying water in the bazar, drawn from wells in the vicinity, and the enteric microbe was found on a piece of mussack. The water from the upper reservoir (No. 1 spring) was discontinued, new pakhals and mussacks were brought into use, the water for drinking and cooking purposes was boiled and permanganate of potash added to it, with the result that the epidemic diminished and finally disappeared. Twenty-eight cases were admitted from No. 14 barrack, and after the men were removed from this barrack room and placed under canvas, only 3 cases occurred. This barrack is to be scraped, replastered, and refloored before being again occupied. A recommendation was made that the use of mussacks and pakhals should be discontinued for the distribution of drinking water and galvanised iron buckets substituted. It was brought to notice that the low caste cooks, with their sweeper friends, were obviously objectionable in the cook-houses, the culinary arrangements in which left much to be desired. The risk of drinking native-made aërated waters, especially when very recently bottled, was pointed out, as well as the advisability of having native hawkers kept out of barracks. The dairy arrangements were admirable. There is only one incinerator, which consumes about half the excreta from barracks, the remainder being buried in deep trenches. Some suitable sites are available for the erection of wire tramways with a view to the excreta being buried in shallow trenches down the hill side. Kasauli.—General sanitary conditions satisfactory. Very few cases of enteric fever occurred during the year, and these were mainly attributed to the contamination of drinking water by the use of pakhals and mussacks for purposes of distribution. The water supply is derived from two sources, and is stated to be very satisfactory, though that on the south side of the hill is open to a possible, though not probable, risk of pollution. Two incinerators and a urine shoot are in use for the disposal of excreta; an offensive smell is sometimes perceptible on the road above the incinerators, but otherwise they are satisfactory. The medical officer in charge suggests that the depôt should remain open until the middle of December instead of being closed in October. The smoking of the hospital chimneys has been much complained of, and is under the consideration of the executive engineer. The cook-houses leave much to be desired. Solon.—General sanitary condition satisfactory. A new and excellent water supply, derived from a perfectly protected spring, is distributed all over the station by pipes, and is removed from the hydrants to the storage receptacles in buckets. Only 3 cases of enteric fever occurred, and these were traced to sources outside the station. The trench system of disposal of sewage is in use, and works very satisfactorily. Two barrack huts are used for a hospital, but a plan for a new hospital has been approved and the building will, it is hoped, be shortly commenced. Jutogh.—The general sanitary condition was satisfactory. There were only 10 cases of enteric fever, and the medical officer in charge is of opinion that the disease was, in the first instance, imported from Umballa, and was subsequently spread by the agency of native servants. He remarks that the drinking water, which is derived from two well-protected springs, is satisfactory, and not a likely source of the disease. The addition of permanganate of potash to the water did not appear to diminish the number of admissions to hospital for enteric fever. He looks on the bazar and its drinks with suspicion, and points out that the evacuations in the early stages of the disease, before the men are admitted to hospital, may remain for a considerable time in the latrine pans, and help to disseminate the disease. He is of opinion that a probable source lies in the cooks, who are of low caste, and associate with their sweeper relatives in the cook-house, the germs being spread by human agency; he advocates that in hill stations, at any rate, the soldier should cook his own food and draw his own water. An incinerator and urine shoot dispose of the excreta.

Lahore District.—Mian Mir.—General sanitary condition satisfactory. The water supply is derived from a branch of the Bari-Doab Canal, which is fed by the River Ravi. The canal is liable to pollution along its whole course, as it passes through a more or less populous district. The supply is intermittent, which is very objectionable. No filters are in use in barracks, but all the water for drinking purposes is boiled and treated with permanganate of potash before being consumed. The sanitary state of the waterworks and their surroundings is satisfactory. A scheme for a new water supply is under

India.

consideration, as well as means for diminishing the risks of pollution of the present supply in the meantime. Compared with last year, there has been a very marked diminution in the number of admissions to hospital for enteric fever, dysentery, and malarial fevers. The arrangements for washing clothes are most defective, mainly owing to the intermittent water supply, which is often turned off for a fortnight at a time; during these intervals the dhobies wash clothes anywhere they can get water, and are not particular as to its source or purity, with the result that the soldiers' clothing is often washed in conjunction with that of the natives. Small-pox was rather prevalent, and was attributed to the unsatisfactory arrangements for washing clothes, &c.; a constant supply of pure water is much needed for the washing ghats, and a scheme is under consideration. The washing of hospital bedding and clothing is also very unsatisfactory; the hospital laundry is not used, owing to the fact that fuel is not authorised for the boiler; the washing is consequently done in the bazars without proper supervision. The Allahabad system of conservancy is in use, and is working very satisfactorily. Fort Lahore.—The main guard-room has not sufficient accommodation, and is greatly exposed to the morning and evening sun; the guard-room cells are intensely hot in the summer months, and are unfit for the purpose of confining prisoners. These defects, to which several cases of heat apoplexy were attributed, are under consideration, with a view to improvements in the present buildings or a change of site. The water supply, which is derived from wells, is unsatisfactory; recent analysis shows the water in two of the wells to be dangerous. All drinking water is boiled and treated with permanganate of potash before being consumed. A project for connecting the fort with the municipal water supply is still under consideration. Jullundur.—General sanitary condition satisfactory, except the surface drainage near the Royal Artillery lines, which is defective. The water supply is derived from a well perfectly protected from pollution, and is satisfactory; that for drinking purposes is treated with permanganate of potash; there were 10 cases of enteric fever, as compared with 4 cases last year, only 5 of the cases, however, appear to have contracted the disease in the station. The arrangements for washing clothing both from barracks and the hospital are unsatisfactory, and a new scheme for the construction of washing tanks is under consideration. The Allahabad system of conservancy is in use, and is working in a most satisfactory manner. Ferozepore.—General sanitary condition satisfactory. Experiments are being made with Canadian stoves for warming barracks. A good and abundant water supply is obtained from wells, protected from pollution; galvanised iron buckets are used for purposes of distribution. There were only 7 cases of enteric fever during the year. The arrangements for washing clothing, &c., are also unsatisfactory at this station, but a new scheme for providing dhobies' ghats is under consideration. The coffee-shop cook-houses are reported to be too small. The Allahabad system of conservancy is working satisfactorily. Amritsar.—General sanitary arrangements good. The condition of the fort ditch has been somewhat improved. The water supply is derived from wells, and is reported to be good and abundant, and perfectly protected from pollution; that for drinking purposes is, however, boiled and treated with permanganate of potash before being consumed. There were only 4 cases of enteric fever during the year. The arrangements for washing clothing, &c., both from barracks and the hospital, are reported to be very primitive and unsatisfactory, as well as being without supervision; a scheme for the introduction of proper washing tanks is under consideration. The Allahabad system of conservancy is in use. Multan.—General sanitary condition satisfactory. A good and abundant water supply is derived from wells in cantonments; leather buckets and mussacks are, however, still in use for the purpose of drawing and distributing the water through the station, and form a possible source of pollution. There were only 8 cases of enteric fever during the year, and at least 3 of these were contracted outside the station. "Multan sores" were rather prevalent during the year amongst the men, women, and children of the battery, located in the fort, and were attributed to the drinking water, which was looked on as suspicious. The battery was moved out of the fort into cantonments in December, and has enjoyed a complete immunity from the disease ever since. The arrangements for washing clothing from barracks and the hospitals are reported to be unsatisfactory at this station, as well as at all the other stations in the Lahore district. The cantonment committee have under consideration a scheme for dhobies' tanks, which allows of a separate supply of water to each dhobie, and does not admit of his standing in the water. The hospital accommodation is not sufficient, but steps are being taken to increase it. The Allahabad system of conservancy has only been partially introduced, but it will, it is hoped, be soon adopted for the entire cantonment. Dalhousie.—General sanitary condition of station satisfactory. A good and abundant supply of water is distributed by a system of pipes; this pipe-water supply has not, however, as yet been laid on to Ranikhet Camp, to which place the water is conveyed in pakhals; it is boiled at this camp before being consumed. Mussacks and chatties have been abolished, and galvanised iron buckets substituted for purposes of distribution. There were 16 cases of enteric fever, at least 4 of which were contracted on the march to the hills. The general health of the troops was much better than last year, there being less than half the number of admissions to hospital. Several new huts, a sergeants' mess, Regimental Institute, cells, guard-room, &c., have been built. New cook-houses, lavatories, latrines, and urinals have in many instances been also erected. The trench system of disposal of night-soil is in use, the Allahabad system not being practicable. The ground available for trenching purposes is somewhat limited, and an incinerator or wire tramway may be required. The arrangements for washing clothes are fairly satisfactory and are under supervision, but there are no properly constructed dhobies' ghats.

Rawal Pindi District.—Rawal Pindi.—The overgrown Lalkurti bazar, between the infantry and cavalry lines, will always be a source of danger in the event of any epidemic disease breaking out; its sanitation is, however, very carefully looked after. The barrack accommodation had to be supplemented by tents to a certain extent during the cold weather, but without any injurious effect on the health of the men under canvas. The intense cold of the early mornings during the winter months has in previous years resulted in a very large number of admissions to hospital for respiratory diseases, especially pneumonia; on the recommendation of the medical officer in charge of the station hospital, parades were held an hour later than had been the custom in previous winters, and to this change may partly be due the greatly diminished number of admissions to hospital for respiratory diseases. With a view to still further diminishing the number of cases of respiratory affections, a proposal is under consideration to issue a short "blanket" coat to the troops at Rawal Pindi, Campbellpore, and Attock for wear in the mornings and evenings. The water supply is excellent and most satisfactory in every respect; it is distributed in galvanised iron buckets. The number of admissions to hospital for enteric fever was only just over half that of the previous year. The two infantry regiments and the three mountain batteries, Royal Artillery, stationed at West Ridge, about 2 miles from Rawal Pindi, enjoyed a comparative immunity from the disease, the Gordon Highlanders only furnishing one case, the Rifle Brigade three, and the Royal Artillery none. The Allahabad system of disposal of sewage is working very satisfactorily. The hospital accommodation was sufficient during the past year, but the admissions to hospital were nearly 1,000 less than in 1895. As more than half the garrison of Rawal Pindi is stationed at West Ridge, 2 miles from the station hospital, efficiency would be increased by converting the section hospital there into an independent station hospital; it is so far away from the station hospital that the medical officer in charge of the latter experiences great difficulty in exercising due supervision over it, and under present arrangements all serious cases have to be transferred to the station hospital. Sialkot.—The general sanitary condition was satisfactory. The water supply is good and abundant, and is obtained from properly protected wells. A scheme for a pipe-water supply is under consideration. Enteric fever was somewhat prevalent during May and December. The barrack accommodation had to be supplemented by tents during the cold weather. The Allahabad conservancy system is in use, and is working very satisfactorily. Campbellpore.—The general sanitary conditions, water supply, and conservancy arrangements have been satisfactory. A recommendation has been made that the neighbouring village, which is very close to cantonments, should be placed under the sanitary supervision of the cantonment authorities. There

India. were only 4 cases of enteric fever during the year. The Allahabad system of conservancy is working very satisfactorily. Attock.—There is little or no vegetation and very few trees about this station. The water supply is frequently deficient; the wells in the fort are of little use, owing to the quantity of chlorides in the water, and water for drinking and cooking purposes has often to be brought from a considerable distance; it is boiled before being consumed. A scheme is under consideration to have a pipe introduced into the bed of the Indus, so that water can be pumped into the fort. There has been no enteric fever during the year. The Allahabad system of disposal of night-soil has been introduced. Murree Hills.—The general sanitary condition of all the stations has been satisfactory. The Murree water supply, derived from Dunga Gali, is of excellent quality, but ran somewhat short during June and July. An extra catchment area is about to be acquired, and another reservoir constructed for the supply of Gharial and Lower Topa, which should obviate this in future. Six out of the ten stations in the Murree Hills are connected with this water supply; the other four stations viz., Ghora Dhaka, Changla Gali, Kalabagh and Bara Gali, derive a satisfactory supply from springs, which are properly protected from pollution, though a possible source of contamination has been brought to notice at Bara Gali, where a new scheme for a water supply is in contemplation. The water is boiled as a precautionary measure at these four stations before being consumed. The trench system of disposal of night-soil is in use at all the stations in the Murree Hills, and works satisfactorily. Wire tramways for conveying the excreta down the hill side are provided at Murree, Gharial, Lower Topa, Kuldana, and Khyra Gali. Only one case of enteric fever originated in the Murree Hills during the year; this was the case of a man who was living in a small camp on the hill side below Gharial, while training for a Khud race; he had been drinking water from doubtful sources. Nine cases were imported from the plains. Murree.—The upper hospital block has been handed over to the military authorities, to increase the barrack accommodation of the depôt. Gharial.—New cells, warmed by stoves, have been erected; additional barrack accommodation has been provided. New lavatories are being constructed. A site has been selected, and plans have been approved, for a new hospital, which is much required. Lower Topa.—The hospital and canteen are the only permanent buildings, the cavalry and artillery details being accommodated in tents. Owing to the close and objectionable proximity of the canteen to the hospital, and the insufficient accommodation afforded by the latter, the canteen building is to be utilised for extra hospital accommodation. Properly constructed cook-houses are required. Kuldana.—The old wooden huts have mostly been replaced by stone buildings. New cells warmed by stoves, and new latrines, have been erected. The Murree water supply was cut off in July, and the former supply resorted to. The hospital cooking, as well as well as that for "A" company, was done in Congo stoves, which worked admirably. The hospital accommodation has been increased by the erection of a new block containing 18 beds, as well as a day room and attendants' room. Thobba.—As this station was rather densely wooded, many trees were cut down so as to allow free perflation of air and admission of sunshine. The troops were accommodated partly in stone huts and partly in tents. The hospital accommodation was insufficient, and tents were used to supplement it. Plans for a new hospital have been approved, and the buildings are to be commenced at an early date. Khyra Gali.—The mountain battery is housed in stone huts. Owing to the distance from barracks of the storage reservoir in connexion with the Murree water supply, pakhals have to be used for purposes of distribution; it would be an advantage if stand-posts were erected about the barracks, or metal tanks for carrying water substituted for pakhals. The hospital accommodation is insufficient, and a scheme for increasing it is under consideration; more suitable quarters are also required for the medical officer in charge. The erection of a mortuary is in contemplation, as the present one is under the same roof as the native drivers' hospital. Changla Gali.—Accommodation both for officers and non-commissioned officers undergoing instruction in the school of musketry is insufficient; many of the wooden huts now occupied are quite out of date and unfit for habitation; steps are being taken to have them replaced by suitable buildings. There is no hospital, the sick being sent to

Khyra Gali, between 2 and 3 miles away. Ghora Dhaka.—The 3 companies of infantry, as well as the sick, are accommodated in tents. A hospital should be built. Kalabagh.—The huts are old and are to be gradually replaced by stone buildings. A new guard-room and cells, warmed by stoves, have been erected. The commissariat bakery and slaughter-house are too close to the mule lines; a proposal to establish them elsewhere is under consideration. The hospital accommodation is sufficient. Bara Gali.—The barrack accommodation is not satisfactory, and the old wooden huts require to be replaced by stone buildings. Tents have to be used to supplement the accommodation afforded by the huts. New cells are to be built, the present ones being small, badly ventilated, and without means for warming. The hospital accommodation is satisfactory.

Peshawar District.—Peshawar.—The general sanitary condition was satisfactory, though, in the opinion of the local medical authorities, there is perhaps too much irrigation about the station. The moderate planting of trees about barracks has been recommended. The enteric microbe was found in a specimen of drinking water taken from one of the storage tanks, which was immediately emptied and disinfected. Steps have been taken to diminish the risk of pollution of the water supply at its source and at the settlement tanks. Enteric fever was prevalent, especially during the months of June, July, and December; the drinking water was boiled, and permanganate of potash added, but without any very beneficial results in diminishing the disease, which was therefore presumably contracted outside barracks. Water is being laid on to the cook-houses. The Allahabad system of disposal of sewage is now working most satisfactorily. Nowshera.—The surface drainage of the regimental lines is somewhat defective; heavy rain, however, is unusual. The water supply is good and abundant, and derived from wells properly protected from pollution. The question of a pipe water supply is in abeyance. Enteric fever was somewhat prevalent in May and June, and its prevalence does not appear to have been diminished by boiling the drinking water or by the addition of permanganate of potash, so that the disease was probably contracted outside the station. The conservancy arrangements have been greatly improved since last year; corrugated iron latrines on the removal system have been introduced into the bazars. The Allahabad system of disposal of sewage is working in a very satisfactory manner. Cherat.—The general sanitary condition was satisfactory. Cook-houses and lavatories are being built for the troops. The water supply is satisfactory on the whole, though it is stated to be liable to occasional pollution from the entrance of surface water after heavy rain, and its distribution in pakhals is objectionable. The hospital accommodation is insufficient, and has to be supplemented by tents. An isolation ward and hospital for sick officers, as well as quarters for the medical officers and assistant surgeons, are much required. The trench system of disposal of night-soil is in use. Very few cases of enteric fever appear to have originated in the station.

MADRAS COMMAND.—The Principal Medical Officer, Surgeon-Major-General C. E. McVittie, Indian Medical Service, reports as follows:—

Madras District.—St. Thomas Mount and Pallaveram.—At St. Thomas' Mount suitable quarters for men of the Army Hospital Corps are much needed, the quarters recently built for them having been handed over to the 14th Madras Infantry, which was transferred from Royapuram. The health of the troops and sanitary condition of barracks occupied has been good as regards both these stations. Poonamallee.—The barracks and hospital at this sanitarium are most excellent buildings in good sanitary repair, with ventilation and lighting as perfect as possible. The native bazar rather closely surrounds the European portion of the cantonment, and rice is cultivated both in and around cantonment, but neither of these facts appear to influence the health of the troops. Madras.—During the year there has been no overcrowding at Fort Saint George, the sanitary condition has been good, and there have been few changes in buildings, &c. St. George's Gate Guard has been discontinued on account of insufficient ventilation. Additional accommodation of two seats has been provided in the Royal Artillery latrine by extending the building. The new detention hospital (which is to replace the old station hospital)

India.

is in process of construction, but will not be completed until 1898, owing to want of funds, the full amount required not having been sanctioned.

Southern District.—Wellington.—The accommodation in barracks and hospital is by no means sufficient for the number of men quartered here during the season (April to October), and tents have to be pitched; the accommodation is, however, being increased as rapidly as possible, especially at the station hospital, where two new wards for 12 and 14 patients respectively are in course of construction. The old matrons' quarters are being converted into a ward for 5 patients, administrative offices are being built, as also a surgery, receiving room, medical store-room, and mortuary. The new female hospital, consisting of a large ward for 8 beds, a small ward, lying-in-ward, and matron's quarters, was completed and occupied last April; an infectious diseases' ward for women has also been constructed during the year. Sanitation has been thoroughly attended to, and the station has maintained its reputation as a sanitarium. Cannanore, Calicut, and Malapuram.—Beyond a mild outbreak of enteric fever at Malapuram, which was probably due to bad water drunk during the Moplah outbreak, there is nothing special to note in connexion with these stations. The removal of the row of native huts near the Roman Catholic church at Malapuram would tend in a great measure to keep the men at this station free from disease. The question of the acquisition of these hovels is under the consideration of the Government of India. Sanitation has been attended to and buildings kept in repair. At Calicut, water from the well at the foot of the hill, which is used for bathing purposes, and in case of emergency for drinking purposes also, is liable to contamination by a foul tank close to it; this tank has been fenced in pending funds being available to fill it in. An incinerator is being built at this station which will remove the system (which has been found objectionable) of throwing refuse into the sea.

Bangalore District.—Bangalore.—The sanitation of barracks and hospitals has been well looked after. Drinking water is obtained from the slaughter-house well and is of good quality, but very liable to contamination. Since August permanganate of potash has been added to it. The scheme for the supply of pipe water to the civil and military station of Bangalore from Chamrajendra reservoir (formerly called the Hessarghatta tank) belonging to the Mysore Durbar has been sanctioned by the Government of India, and every effort is being made to push on the work as rapidly as possible; it is hoped that this will diminish the number of cases of enteric fever, which has been much more prevalent this year than usual, there having been 47 admissions to hospital for this disease as against 18 in the previous year. The disease was spread over the whole year, and not localised to any particular corps or place; the type was severe, there having been 17 deaths out of the 47 admissions. The source of infection was not in a single instance evident after the most careful investigation. There has been some overcrowding in the British Cavalry barracks for about 9 months (January to September), but no special illness has been directly attributed to this. The deficient accommodation in the parade barracks (British Infantry) still exists, but steps are being taken to remedy the defect; two blocks lining the main road (formerly used as married quarters) are being converted into quarters for single men, and one set of colour sergeants' quarters at the end of each block are also being similarly converted. Small-pox was prevalent at the close of 1895 amongst the civil population in various parts of Bangalore and in the Ulsoor bazar close to the Royal Horse Artillery barracks (where many of the followers and private servants live), and continued to prevail during the early months of the year under review; this disease appeared amongst the British troops early this year (1896), there having been 17 cases amongst the men (2 fatal), 7 amongst the families (1 fatal), and one officer had a mild attack. Cholera was also prevalent amongst the civil population to a considerable extent during the early part of the year, and four cases (all fatal) occurred amongst the British troops, probably contracted in the bazars. There was a mild outbreak of measles early in the year (22 cases amongst children and 4 amongst men). The hospitals (station and section) have been kept in a good state of repair, and various changes and improvements made; at the station hospital quarters for 28 married and 36 single men of the Army Hospital Corps have been completed and handed over, also quarters for 10 sweepers of the Army Hospital Corps, for 4 hospital storekeepers, and 1 hospital assistant; quarters for 4 assistant surgeons have been provided by converting rooms in the married block of the British Cavalry lines; a laundry, disinfecting room, and purveyors' store have been built. At the section hospital a ward has been converted into quarters for 2 assistant surgeons, and the necessary outhouses for this have been built; the cart-shed has been converted into two servants' quarters, and a new cart-shed built, also quarters for a hospital storekeeper, and for 12 single and 6 married Army Hospital Corps men. The accommodation at the station hospital is insufficient, and to prevent overcrowding has been supplemented by tents. It is now proposed to build a new block to hold 45 beds (that being the number which is required to complete the hospital accommodation to 210, the limit fixed for the garrison), the plan and estimates for which have been sanctioned, and work will probably commence next year.

Secunderabad and Belgaum Districts.—Secunderabad.—The health of the troops has been bad; there has been this year an increase of 177 in the average strength with an increase in admissions of 254. General sanitation has been well attended to, but in spite of all precautions there were 96 admissions (as against 78 during 1895) for enteric fever. By far the largest number of admissions took place in July and August, and the regiment principally affected was the 1st Northamptonshire occupying the 2nd British infantry lines, 51 out of the 96 cases having occurred in this regiment. No definite cause could be discovered for this great disparity, but it must be remarked that a diminution of the number of cases was observed about three weeks after the discontinuance of the distribution of boiled water to the barrack rooms by mussacks, and at the same time the prohibition of the purchase of bazar butter, and the issuing of orders for all milk to be boiled, so it would appear that the outbreak might be traced to the above causes. The drinking water, which is of good quality, has been boiled, and permanganate of potash used. The hospital accommodation is insufficient, notwithstanding that a barrack room capable of holding 54 men has been handed over as an extra ward; it was necessary to use tents at the station and section hospitals during the greater part of the year to accommodate the extra sick. This drawback will, however, soon disappear, as new hospital buildings to accommodate 100 patients are under construction at the section hospitals. A building conveniently situated, containing offices for medical officers and clerks, a store room, and a waiting-room for patients, has been erected during the year. Belgaum.—The accommodation in both cantonments and fort has been ample, and the general condition of drainage throughout the station has been satisfactory. The ventilation of the converted blocks (barracks), considered defective a year ago, has been improved. It is desirable that the cook-houses of the infantry barracks should be provided with ovens to allow of variety in cooking, and with flues; as regards flues these are required for the cook-houses of nearly all the stations in this Command, the flue recommended being Colonel Brooke Anderson's, which consists of a large flue into which others run from the several fireplaces, causing greater draught and more complete combustion, as well as allowing smoke, dust, ashes, &c. to escape. The station hospital buildings as a whole are old and defective, the roofing is composed of old rough tiles which are neither wind nor weather proof, and in the monsoon some portions of the wards cannot be occupied; in four of the wards the lighting is bad; the walls are built of soft laterite, which is very porous and causes dampness; the mortuary is too near the road; there is no infectious ward, and no ward for officers. A scheme has, however, been prepared whereby it is hoped many of these defects may be rectified at very little cost to the State; a disinfecting boiler has been sanctioned, and by re-appropriation of certain existing buildings an infectious and officers' ward can be provided. The washing arrangements are defective, there being no wash-house or laundry attached to the hospital, and great trouble occurs during the monsoon from irregularities of dhobies. The General Officer Commanding and the Cantonment Committee are taking up the matter of dhobies as a whole for the garrison. The assistant surgeon's quarters are not up to regulation as regards accommodation, but the Army Hospital Corps' quarters are especially bad, being ill ventilated and old buildings without latrines in the vicinity; a latrine has, however, been sanctioned, so this latter defect should soon be remedied. A scheme is on foot for establishing a Government dairy farm on

India.

the same lines as the one at present carried on by the commissariat department at Allahabad. The water supply is of good quality, but deficient in quantity; the municipality is preparing a project for a pipe-water supply, and have offered to provide in their system for an ample supply to cantonments. Bellary.—The health at this station has been good, and the sanitation satisfactory. The system whereby the drinking water is drawn by bullocks from a deep uncovered well near barracks, from whence it is conducted by a covered conduit to reservoirs in barracks, is still in existence, but seeing that the municipality is considering a scheme for the water supply of Bellary, which, if successful, will be extended to cantonments, the question of using pumps for raising and distributing the water from the wells has been held in abeyance. Ramandroog.—The water is obtained from wells which need more protection, being liable to pollution from surface drainage. As regards the detachment which goes to this hill station for the hot weather, every precaution is taken in the disposal of night-soil, but more supervision is required in this particular over the filth from bungalows occupied by civilians; the plateau being of a limited extent it follows that, unless great care is taken in this matter, there is risk of contamination of the water. This has been pointed out to the collector, who has taken the necessary steps to have the defects remedied.

Rangoon District.—Rangoon.—The sanitation and repair of barracks during the year has been well attended to. The Royal Artillery barracks and married quarters are old, and the accommodation in the former is insufficient, 40 men having to be kept at Syriam. The kitchens in the British Infantry and Royal Artillery barracks are unsatisfactory, especially the former, the cooking places being so constructed that there is neither light nor air; the adoption of Anderson's flues (which have been recommended) would remedy this to a great extent. The British Infantry gymnasium (which is only a temporary building) is too small; it is proposed to build a new gymnasium, and steps are now being taken to give effect to this proposition. Drinking water is obtained from wells situated in the regimental lines, and is drawn by hand in buckets (instead of mussacks, as in 1895) and conveyed to the Macnamara filter cases by a cart. During the dry weather these wells run dry, the result being that at this time water has to be obtained from the Royal lakes; both supplies are of good quality. Influenza prevailed during the first three months of the year. An inquiry was made during the year as to the prevalence of dysentery in this station, which elicited the fact that the greatest number of admissions occur during the months of June and July, that is, during the south-west monsoon, which causes a rapid and complete change of weather. During the first months of the monsoon the rain is almost continuous, and the variations of temperature during the 24 hours frequent and great, the result being chills and dysentery. The hospital accommodation during the year has been, as usual, insufficient; the average number of patients in occupation has been 146, whereas there is only room for 110, the excess being put in temporary wards under blocks 1 and 4 and in the verandahs. An infectious ward is under construction. Meiktila.—The water supply is "bad," the water being taken from a lake by bullock carts which are driven into it, thereby polluting the water; a pump on a stage has been recommended. The station is healthy; there was no admission for enteric fever during the year. Thayetmyo.—There has been no case of enteric fever or cholera amongst the British troops at this station during the year. The hospital accommodation has been insufficient; a barrack-room had to be used for this purpose from April 20th to December 8th. The officers' bungalows, which are in private hands, remain in the same condition of dilapidation with defective surface drainage. Port Blair.—The sanitary condition of barracks and hospital is good, as has also been the health of the detachment, the majority of the 135 admissions to hospital recorded during the year having been of a trivial or mild character. The healthy appearance of the men after their residence in this station is evidence of the sanitary condition and the advantages of sea air.

Mandalay District.—Mandalay.—During the year there have been no epidemics, very few cases of enteric fever, and the health of the troops has been good, with the exception of that of No. 6 mountain battery, which was bad. The great want of Mandalay cantonment is good drainage and good drinking water; owing to the nature of the soil (subsoil of clay covered by cotton soil) and the small amount of fall (1 in 1,200), drainage of surface water is a very difficult matter, and the masonry drains are frequently blocked. This defect has been from time to time reported, and the drains are occasionally widened and cleaned out, but they soon become blocked again during the rains. The barracks and hospital have been kept in repair, a new bakery has been built for British troops, new guard-room, cells, and lavatories for Royal Artillery lines, and the ventilation and lighting of the hospital has been improved. The water supply from the moat is used for all purposes, and although constantly exposed to pollution (especially at night) no specific disease appears to be attributable or traceable thereto; the water before use is boiled and treated with alum and permanganate of potash. Seeing how liable this moat is to contamination, its banks being thronged with natives who live in the bazar all around, it is most important that immediate steps should be taken to provide another water supply. The brewery at Mandalay obtains beautifully clear pure water from a well, and the question of obtaining a similar supply for the troops in cantonment is now under consideration. Bernardmyo.—On the whole the health of the men has been good, nearly all having benefited by their year's residence at this station. The water supply (from a mountain stream) is good, no diseases have been traced to contamination of water, and there is no record of such diseases as enteric fever or cholera having ever originated at this station, and none occurred during the present year. A new quarter guard-room has been built during the year; the ventilation of barrack rooms has been improved by putting in larger windows, and the walls of several have been felted to prevent draughts. Puckka drains are required for the kitchens. The hospital has been kept in a good state of repair, its cookhouse enlarged and a covered passage built connecting it with the wards, which was greatly needed during the rains. The Army Hospital Corps' quarters are sufficient, and have been improved by the addition of plank floors and glazed windows. There is practically only room in the hospital for 10 patients; another ward was asked for by the last annual board on major works to accommodate six more patients. Bhamo.—The barracks and hospital are over ventilated; this is especially felt during the cold weather (when the thermometer occasionally falls to 40° F.), and, seeing that there are no means of warming them, more solidly built structures would be preferable, if this station is to be a permanent one for British troops. The buildings have been kept in a good state of repair, and sanitation attended to; the cemented surface drains, which previously ran into nullahs around some of the bungalows, are being extended so as to carry the surface water outside the fort. Shwebo.—The general sanitation of barracks and hospital has been well attended to. The water supply is suspicious, the collecting area being open to pollution; all drinking water is boiled and treated with alum and permanganate of potash before use. Accommodation in barracks during a great part of the year has been insufficient; to prevent overcrowding men have been put on the ground floor beneath the bungalows or in tents. The ventilation of the married quarters is insufficient. More quarters are required for the Army Hospital Corps, there being only six quarters for seventeen men.

India.

BOMBAY COMMAND.—The Principal Medical Officer, Surgeon-Major-General A. F. Churchill, M.B., has made the following reports on the sanitary condition of the various stations:—

Poona District.—Poona.—The health of the troops generally has been fair during the year. The sanitary conditions of the barracks and hospitals have been satisfactory, except that some of the old barracks at Ghorpuri leaked during the heavy monsoon. The admissions and constantly sick have been considerably less than last year, probably because the bazars and city were put out of bounds for some months owing to the prevalence of small-pox and cholera, which reduced the number of admissions for venereal, but the death rate has been greater in consequence of the prevalence of cholera in an epidemic form. 13 cases occurred, 10 in Wanowrie Barracks and 3 in Ghorpuri Barracks, all of which proved fatal. A fatal case also occurred in the nursing staff of the station. The admissions for enteric fever were less than in 1895, but the mortality was higher, particularly in the early part of the year. The type of

India.

the disease during the latter part of the year was less severe, and this is probably to a considerable extent attributable to the water being boiled and treated with permanganate of potash since May 1896, and also to the abolition of Macnamara filters. Out of six cases of enteric fever among officers living in their own houses three were fatal. During the year, meat-safes of the latest pattern were built in each cook-house, glazed privy pans were substituted for iron ones, and the dairy of the Durham Light Infantry was improved by paving the floor. Kirkee.—The health of the troops during the year has been bad owing to the prevalence of enteric and malarial fevers and, as usual, venereal disease. Enteric fever caused 40 admissions among men and 3 among officers, 29 out of the 40 were young soldiers lately arrived in the country, as had also 2 out of the 3 officers. 17 deaths occurred among the men from this disease. No very evident local insanitary cause for enteric exists at Kirkee, the water supply and general sanitary state of the station being to all appearances good. The explanation seems to be that many of the men were young and new arrivals in the country, and were therefore liable to contract the disease from sources as yet uncertain but possibly connected with the bazar, and the impure food and drinks obtained there. Cholera, though prevalent in the vicinity, did not attack the troops. During the year there has been no alteration in the accommodation of the barracks. The same fault continues to exist in the patcheries of the infantry detachment, viz., insufficient floor and cubic space. The sanitation of the cantonment has been fairly satisfactory, the Poona bazar being a very large and unwieldy one and difficult to keep in order. The work connected with the filtration of the water at the Pashan lake, which supplies Kirkee, is nearing completion. Ahmednagar.—The general health of the troops has been indifferent owing to the prevalence of malarial fevers and venereal disease. The sanitary condition of the barracks and hospital has been satisfactory. Enteric fever caused 13 admissions with 2 deaths only. Boiling the drinking water appears to have been beneficial in preventing enteric fever. One fatal case of cholera occurred. No additions were made to the buildings during the year except as regards drainage. The refuse waters of the artillery married quarters is discharged into nullahs instead of being collected in tanks. The question of the Walu aqueduct is under consideration. The water supply is from a good source, but appears liable to contamination en route at the shafts (of which there are several), where it is drawn up by bhisties with buckets. The accommodation has been ample and the ventilation satisfactory. Sataro.—The health of the troops has been indifferent for the same reasons as at Ahmednagar. As regards ague, many of the men contracted the disease at their last station (Quetta), and several of the cases of syphilis were imported. One fatal case of enteric fever occurred. There was no overcrowding, and the sanitary state of the buildings was satisfactory. Purandhur.—The general health of the convalescents was good, and no disease of any consequence appears to have originated at the depôt. The sanitary state of the barracks was good, but almost all the houses (which are owned by natives) are in a tumbledown and insanitary state.

Mhow District.—Mhow.—The health of the troops has been bad during the greater part of the year, owing to the prevalence of venereal and enteric and malarial fevers. The infantry regiment, which came from Karachi, was saturated with malaria, and the cavalry regiment, being in its first year of service in India, contributed to swell the number of admissions for this class of disease. Enteric fever caused 70 admissions and 9 deaths. There were 3 cases among officers, 5 among women, and 1 among children, which, according to the medical officer's opinion, is an unusual occurrence at Mhow. Several cases of men admitted for venereal disease, having developed enteric fever shortly after admission, points to the conclusion that the two diseases were contracted in the bazar. The Mhow bazar has been allowed to grow far beyond reasonable limits, and the difficulty of keeping it in a sanitary condition has undoubtedly been the cause of much enteric. The barrack accommodation is barely enough for the strength at Mhow, and men have to be accommodated in the empty block of married quarters of the infantry lines. There is generally a large per-centage of sick, however, which prevents overcrowding. The water supply from the Bircha Lake is not sufficiently protected from chance pollution, and until filter beds are introduced enteric fever is unlikely to decrease in amount. There were 2 fatal cases of cholera; these occurred among the men of a draft of the infantry regiment while en route from Bombay. Several additions and alterations were made to the buildings during the year, and others are in progress. Nasirabad.—As noticed in my last report, the sanitary condition of barracks still continues to be unsatisfactory; immediate steps are, however, being taken to refloor Nos. 1 and 2 barrack rooms and to improve the latrines. The hospital is in a good sanitary condition. There has been no overcrowding either in the barracks or hospital. Excluding venereal disease and enteric fever, the health of the troops has been generally good. Enteric fever caused 29 admissions and 12 deaths, a large mortality, most of the cases being of a very severe type. The Dilwara water used for drinking purposes was examined and found to be free from the enteric microbe, but the Danta water used for washing was not so. No cases of cholera occurred, but there were 4 cases of small-pox; these made a good recovery. Neemuch.—Owing to the removal of a battery of field artillery to Mhow, the accommodation has been ample both in barracks and hospital, but the health of the troops has been indifferent. There were 5 cases of enteric fever with 3 deaths, 2 of which were in all probability contracted at Nasirabad. There was no cholera. The sanitary condition of the barracks and hospital has been satisfactory. There was one case of small-pox, which recovered. The want of a hospital for infectious diseases is much felt at Neemuch, as the treatment of cases in tents and grass huts during the hot season is most objectionable. Indore.—The health of the troops has been indifferent, although the sanitary condition of barracks and hospital has been satisfactory. There were 4 cases of enteric fever, 3 of which proved fatal. There were also 2 cases of cholera, both of which ended fatally. The mortality (6) is considered unusual for the detachment at Indore. The water supply is good and sufficient, but more surface drains are required to carry off the roof water. Taragarh.—The general health of the troops has been fair. There has been a marked improvement in all the cases sent up, particularly convalescents from enteric. The accommodation and ventilation was sufficient. The water is brought up from Ajmere on mules in leathern mussacks. It was good and sufficient. There were no cases of enteric fever, cholera, or small-pox, and no deaths.

India.

Bombay District.—Colaba.—Excluding venereal disease, the health of the troops has been good, and the sanitary condition of barracks and hospital satisfactory. A new hospital is under construction, the present building having been condemned as unsuited to modern military medical requirements. Excepting the depôt, which is occasionally overcrowded during the trooping season, the accommodation is ample. Only 2 cases of enteric fever occurred during the year; the first, an indigenous case, recovered, but the second, an undoubtedly imported one, terminated fatally. The year 1896 bears evidence of the immunity which Colaba enjoys from enteric fever in comparison with stations like Quetta, Poona, and Mhow, the climate of which is less of a tropical character. A case of sunstroke occurred, but it is remarkable that, although his temperature rose to 109·2, the man recovered. In September a severe epidemic of bubonic plague broke out in Bombay, and since then the civil population has been dying by hundreds. Several cases occurred at Colaba, but there was not one in the garrison up to the close of the year, the strictest precautions having been taken to protect the troops. Deolali.—The sanitary condition of barracks and hospital has been good, but the health of the troops bad. Enteric fever caused 26 cases and 5 deaths, but out of these only 5 originated at Deolali, and were attributed to the consumption of aërated waters in the bazar. An officer was also attacked; in this case the disease was traced to Mhow. There was 1 fatal case of cholera, which was undoubtedly contracted in the bazar, as the patient was almost living there. Small-pox caused 3 admissions, 2 men and 1 woman, all imported. The question of building an additional storey to the hospital is under consideration, and when carried out will be a much desired improvement, as the system of putting the sick under canvas when the hospital is full during the trooping season is very objectionable. No epidemics prevailed. Khandalla.—The health of the troops has been fair, and the sanitary condition of barracks and hospital satisfactory. There was no overcrowding. One case of enteric fever occurred in the person of the medical officer in charge of the sanitarium. Want of suitable quarters for

India.

the assistant surgeon still exists. The hospital is also very deficient in store rooms.

Deesa District.—Deesa.—Both the barracks and hospital were in good sanitary condition, well ventilated, and the accommodation was ample. The general health of the troops, however, has been bad, owing to venereal disease and malarial fevers. There were 2 cases of enteric fever of a virulent type, but both recovered. The sandy soil of this station may have something to do with the immunity it enjoys from attacks of cholera. The water supply (obtained from wells) is good. The pump ordered to be constructed is nearly ready. The Allahabad system of conservancy works well. Ahmedabad.—The general health of the troops has been bad. The sanitary condition of the station hospital, barracks, and camp generally has been satisfactory, and there was no overcrowding. There was 1 case of enteric fever and 1 of cholera; both died. The municipal water supply was introduced in September. Improved arrangements have been adopted to carry off the added water, and the catch-pits are filled up. Boiling the drinking water and treating it with permanganate of potash has resulted in a marked decrease of enteric fever cases. Several cases of plague were imported from Bombay into the city, but there was no case in camp. All precautions were taken, and the city placed out of bounds. Abu.—The general health of the troops has been very satisfactory as compared with 1895. The only case of enteric fever was a transfer from Mhow, which was discharged after a week. Better arrangements have been made for the supply of milk than in former years, but the butter is still purchased in the bazar and is liable to contamination. A ward for officers has been sanctioned.

Aden District.—Aden.—The sanitary condition of the barracks and their surroundings has been satisfactory, and the outhouses have been kept clean and in good order. The general health of the troops has been fair. Enteric fever caused 4 admissions and 2 deaths. There were 3 cases of measles, of which 1 was fatal (due to hyperpyrexia). A change for the better is to be noted in the number of cases of simple continued fever, there being only 5 admissions as against 105 in 1895. The new hospital at Steamer Point is steadily progressing, and it is hoped will be ready for use by the end of the year 1897. This will remove a want felt for so many years regarding the housing of the sick. The water supply has been good and sufficient; the only possible danger connected with it lies in its distribution, and subsequent storage.

Sind District.—Karachi.—The general health of the garrison was fair, but it became indifferent during the last two months of the year, owing to the prevalence of ague. The sanitary condition of barracks and hospitals has been very satisfactory, ventilation ample, and accommodation sufficient. Enteric fever caused 9 admissions and 1 death only. All the cases were sporadic and occurred at intervals, indicating no special source of infection. No epidemic prevailed. The hospital water supply, hitherto insufficient, has been increased by the laying down of a new 2½-inch pipe direct from the main. This is an improvement, but the pressure is not sufficient to carry the water to the upper storey, for which purpose pumping has still to be resorted to. The water supply is ample and the quality fair. The filling up of disused water tanks is being proceeded with. Orders have also been issued that no taps are to be allowed to run at night, and meters have also been placed on some of the mains with a view to stopping undue saturation of the soil. By these means it is hoped that the level of the subsoil water will be lowered, and the number of cases of malarial fevers lessened. Complaints were made to the municipal authorities that the filth carts were being emptied on waste land near the public road, and that natives were in the habit of using nullahs and bridges, &c. as latrines. Very active measures were taken to prevent the nuisance, which have been attended with good results. In the beginning of December several cases of bubonic plague occurred in the civil population, and on the 10th of the month Karachi was declared an infected port. In view of the possibility of cases in cantonments, adequate arrangements were made both at the station hospital and at the followers' hospital for the isolation and treatment of those infected. No cases occurred among troops. Hyderabad.—The sanitary condition of the barracks and hospital has been satisfactory, but the health of the troops was bad, owing to venereal disease. Enteric fever caused

India.

6 admissions and 2 deaths. There was also a case among officers. Recommendations have been made for improving the water supply. The intake is at the edge of the river, and this is most objectionable on sanitary grounds; the pipe should be taken to the centre of the river. The urinals require improvement. and water taps are required in each bath-room. These will be shortly provided.

Nagpur District.—Kamptee.—The sanitary condition of the barracks and hospital has been very satisfactory. There has been no overcrowding or defective ventilation, and with the exception of the existence in the married quarters of the British regiment of a cook-house and latrine under one roof, no defects in drainage, latrines, or water supply, Steps have been taken to remedy the above insanitary state of things. The health of the troops has been fair. Enteric fever caused 11 admissions and 6 deaths. The medical officer attributes decrease of enteric fever cases to the rigid inspection of wells supplying drinking water and to the medication of these by permanganate of potash. No epidemics prevailed. Sitabuldi.—The general health of the men garrisoning the fort has been good during the year, and the sanitary condition of barrack and hospital satisfactory. There was 1 case of enteric fever, which was a transfer from Kamptee. The roof of the barrack again leaked during heavy rain. The engineering department have remedied the defect.

Quetta District.—Quetta.—With the exception of venereal disease and enteric fever, the general health of the troops has been good. There was a severe outbreak of enteric fever during the year for which it is most difficult to account. The first case appeared in April, 3 cases in May, 29 in June, 24 in July, 33 in August, 18 in September, 25 in October, 6 in November, and 1 in December, giving a total of 140 admissions with 22 deaths. The drinking water (although coming from an excellent source) was boiled and treated with permanganate of potash. All milk was boiled, and every means taken to ensure that the food and drink of the men was good, but without appreciable effect on the epidemic. The true cause lies probably in the Quetta bazar. The great majority of the men who were attacked had been down to the bazar for the usual reason. Now that the Quetta "Chakla" has been done away with, the prostitutes live anywhere and under no sort of supervision with the above result. This view is strengthened by the fact that non-commissioned officers, married men and families, though drinking the same water and milk, were not attacked. There were 3 cases of small-pox, of which 1 was fatal. There was also a fatal case of scarlet fever. No history of infection can be given. The sanitary condition of the barracks and station generally was satisfactory. Several additions were made to the buildings and barracks. Six sets of quarters were constructed for assistant surgeons.

XIV.—ON THE HEALTH OF THE TROOPS SERVING IN EGYPT AND CYPRUS.

Sickness and Mortality.

Egypt and Cyprus.

The average strength of British troops serving in the Command during the year was 3,916 warrant and non-commissioned officers and men, of whom 3,788 were stationed in Egypt and 128 in Cyprus. The force in Egypt was 716 and in Cyprus 48 less than in 1895. The troops in Egypt throughout the year comprised the 32nd Field Battery and No. 16 Company, Eastern Division, Royal Artillery, a company of the Royal Engineers, the 1st Battalion Gloucestershire Regiment, the 1st Battalion North Staffordshire Regiment, and the 2nd Battalion Connaught Rangers, the Mounted Infantry, and detachments of the Army Service, Medical Staff, Army Ordnance, and Army Pay Corps, Military Police, and General Staff. The 1st Battalion North Staffordshire Regiment was up the Nile from March until October, and the 1st Battalion Gloucestershire Regiment furnished a detachment to garrison Cyprus during the greater part of the year.

The 21st Hussars arrived from India in October, relieving the 2nd Dragoon Guards, who proceeded to England.

The force in Cyprus consisted of the detachment of the 1st Battalion Gloucestershire Regiment until November, when it was relieved by a detachment of the 1st Battalion Lincolnshire Regiment from Malta. A few men of the Royal Engineers and other corps were stationed there throughout the year.

The general health of the troops in the Command was good. In Egypt the great improvement noted in the previous year's report still continued. In Cyprus an increase in the ratios of sickness is recorded.

The principal statistics of sickness, mortality, and invaliding in the whole Command are shown in the subjoined table, as well as those for Egypt and Cyprus separately:—

1896.	Average Strength.	Admissions.	Deaths			Invalids	
			In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.
Egypt - -	3,788	3,083	52	—	52	36	29
Cyprus - -	128	137	—	—	—		
Command - -	3,916	3,220	52	—	52	36	29

(*continued.*)

1896.	Constantly Sick.	Ratios per 1,000 of Strength.				
		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
Egypt - - -	240·06	813·9	13·73	9·19	7·40	63·37
Cyprus - - -	7·17	1070·3	—			56·02
Command - -	247·23	822·3	13·28	9·19	7·40	63·13

Egypt and Cyprus

Comparing the ratios for the whole Command with those for the previous year a decrease of 97·8 is observed in the admission rate, and an increase of 5·37 in the death rate, while the constantly sick rate remained unaltered. In comparison with similar average ratios for the ten years 1886–95 there is a decline of 247·4 in the admission rate, 3·02 in that of mortality, and 4·16 per 1,000 in that of constantly sick.

The average sick time to each soldier, 23·11 days, is fractionally longer than in 1895, but shorter by nearly a day and a half than the average period for the preceding ten years; the average duration of each case of sickness was 28·10 days, being longer in the two comparisons by 3·06 and 5·14 days respectively.

Taking Egypt alone, the admission rate is lower by 113·9, and the constantly sick rate by ·91 than in 1895, the ratio of mortality having increased by 5·74, while compared with decennial average ratios a decline of 292·3, 6·56, and 3·88 has occurred in the three ratios respectively. The average sick time to each soldier was 23·19 days, about a quarter of a day shorter than in 1895, and 2·33 days less than the average period for the preceding ten years, the average duration of each case of sickness being 28·50 days, which is longer than in the previous year, and than the average period by 3·21 and 5·43 days respectively.

The health statistics of the two stations in Egypt at present occupied by British troops are given below:—

Stations.	Average Strength.	Admissions.	Deaths.	Ratios per 1,000.	
				Admissions.	Deaths.
Cairo - -	2,910	2,401	46	825·1	15·81
Alexandria - -	878	682	6	776·8	6·83

As in the preceding year, the admission and mortality ratios were higher for Cairo than for Alexandria. Comparing these ratios in each station with those for 1895, it is found that in Cairo the admission rate has declined by 106·0, and in Alexandria by 140·6, while the mortality ratio in the former has increased by 6·18, and in the latter by 4·05 per 1,000.

The admission and constantly sick rates in Cyprus were higher than those for the previous year by 348·7 and 22·38, and than the average ratios for the ten years 1886–95 by 321·3 and 12·19 per 1,000 respectively, the death rate being *nil* as compared with 5·68 in 1895, and with 4·82, the average rate. The average sick time to each soldier, 20·50 days, is longer than in the year before, and than the decennial average period by 8·22 and 4·50 days respectively; the average duration of each case of sickness, 19·15 days, being longer than in 1895 by 2·14, but shorter than the average period by 2·21 days.

In Abstract XXV. are shown the more important statistics of the troops in the Command by arms of the service and by corps.

In the Cavalry the admission, mortality, and constantly sick rates were 909·8, 4·01, and 66·65 per 1,000 respectively, comparing favourably with 1267·7, 7·87, and 83·84 in 1895. In the Artillery the rates were 742·9, 9·40, and 55·64, which are also lower than in the previous year. The ratios for the Engineers, 256·6, 8·85, and 16·37 per 1,000, are all somewhat higher, and in the Infantry the admission rate, 888·9, is lower, but the death and constantly sick rates, 16·02 and 69·74 per 1,000, are higher than in 1895.

Of separate corps, excluding those of small average strength, the 21st Hussars gave the highest admission and constantly sick rates, namely, 1308·5 and 79·36 per 1,000 respectively. These high ratios are stated to be due to the fact that some of the men were tainted with malaria before arrival from India. The next highest admission and constantly sick ratios were 963·5 and 77·76 per 1,000 in the 1st Battalion North Staffordshire Regiment, which took part in the Dongola Expedition. The lowest admission and constantly sick

Egypt and Cyprus.

rates were 266·7 and 17·43 per 1,000 in the 2nd Company, Royal Engineers, the next lowest being 509·4 and 22·92 respectively in the Medical Staff Corps. Mortality was highest in the 1st Battalion North Staffordshire Regiment, 45·22 per 1,000, the next highest death rate being 18·52 in the Mounted Infantry. Both of these units took part in the Dongola Expedition. The lowest death rate was 2·47 per 1,000 in the 2nd Dragoon Guards, the next lowest being 5·12 in the 1st Battalion Gloucestershire Regiment.

The sickness and mortality among the troops, arranged according to the ages of the men, are shown in the following table :—

Ages.	Average Strength.	Admissions.	Deaths.	Invalids.	Ratios per 1,000.		
					Admissions.	Deaths.	Invaliding.
Under 20 years -	176	110	—	1	625·0	—	5·68
From 20 to 25 years	2,270	2,206	28	19	971·8	12·32	8·36
„ 25 „ 30 „ -	1,130	793	17	11	704·4	15·05	9·74
„ 30 „ 35 „ -	207	75	4	4	362·3	19·34	19·34
„ 35 „ 40 „ -	92	29	2	—	315·2	21·74	—
Over 40 years -	41	7	1	1	170·7	24·39	24·39
Total -	3,916	3,220	52	36	822·3	13·28	9·19

The admission ratio of men under 20 years of age was 625·0 per 1,000 of the average strength, the highest ratio being 971·8 among men between 20 and 25 years. In the succeeding age periods the ratios declined in regular sequence, reaching the lowest point among men of more than 40 years of age. In 1895 the highest ratio was also among men between 20 and 25 years but the lowest was among men between 30 and 35 years. There was no mortality among men under 20 years; among those between 20 and 25 years the ratio was 12·32 per 1,000 of the average strength at that age, after which a gradual rise is observed to 24·39 per 1,000 in men of over 40 years. In the preceding year the highest death rate was among men between 35 and 40 years, no death occurring among men of more than 40 years of age.

With regard to the influence of service in the Command on sickness and mortality amongst the troops, the following table has been compiled :—

Length of Service in Command.	Average Strength.	Admissions.	Deaths.	Invalids.	Ratio per 1,000.		
					Admissions.	Deaths.	Invaliding.
Under 1 year -	1,734	1,460	16	11	842·0	9·22	6·34
From 1 to 2 years -	1,642	1,410	26	15	858·1	15·82	9·13
„ 2 „ 3 „ -	254	216	8	9	850·4	31·50	35·44
„ 3 „ 4 „ -	194	108	—	—	556·7	—	—
„ 4 „ 5 „ -	48	9	—	—	187·5	—	—
„ 5 „ 10 „ -	36	15	1	1	416·7	27·77	27·77
Over 10 years -	8	2	1	—	250·0	125·00	—
Total -	3,916	3,220	52	36	822·3	13·28	9·19

It will be seen that the highest admission rate was among men in their second year of service in the Command. It was, however, but little in excess of the rates for men in their first and third years. A considerable decline occurred among men in their fourth year, and the lowest ratio was among men in their fifth year in the Command. Among men of from

Egypt and Cyprus.

five to ten years' service the rate increased, but declined again among men of over ten years in residence. In the previous year the highest ratio was among men in their first year of service, the next highest being among men in their third and second years, after which the ratios steadily declined. The highest ratio of mortality was 125·00 per 1,000 among men of over 10 years' service, but this high rate was dependent on a single death in a very small average strength. Among men in their third year the ratio was 31·50 per 1,000, followed by 27·77 among men of between five and ten years' service, 15·82 among men in their second, and 9·22 among men in their first year. There was no death among men in their fourth or fifth years of service in the Command. In 1895 the highest death rate was that of men in their first year, followed by those of men in their second, third, and fourth years, no death being recorded among the men who had been over four years in the Command.

The more important of the statistics of sickness and mortality among the troops, arranged according to the different groups and orders of diseases, will be found in Abstract XXI.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—Two cases of *small-pox* occurred at Cairo, both were of a modified type and recovered. In 1895 there were 4 cases in Cairo and 1 in Alexandria. For *other eruptive fevers* there were 10 admissions, comprising 5 for epidemic rose rash, 3 for measles, and 2 for scarlet fever. With the exception of one case of scarlet fever in Alexandria, all these admissions were in Cairo.

Enteric Fever caused 97 admissions and 23 deaths, and there were 21·67 men constantly sick from this disease. The admission, death, and constantly sick rates were 24·8, 5·87, and 5·54 per 1,000, being higher than those for 1895 by 8·6, 3·09, and 1·58 respectively, Compared with corresponding ratios for the preceding ten years, the admission rate is lower by 7·5 and the death rate by 2·52, but the constantly sick rate is higher by ·38 per 1,000. The per-centage of mortality to attacks was 18·5 as compared with 17·1 in 1895, and 26·0, the average per-centage for the ten years 1886–95. In addition to the admissions recorded in Cairo and Alexandria, 27 men were transferred from up the Nile, suffering from the disease. These have been included in estimating the per-centage of mortality to attacks, so that the total number of cases entering into the calculation in 1896 was 124.

The relative sickness and mortality from enteric fever in the two stations, Cairo and Alexandria, is shown below :—

Stations.	Average Strength.	Admissions.	Deaths.	Ratio per 1,000.	
				Admissions.	Deaths.
Cairo - -	2,910	*40	*9	*13·7	*3·09
Alexandria - -	878	10	1	11·4	1·14
Total - -	3,788	*50	*10	*13·2	*2·64

* Exclusive of 47 admissions and 13 deaths in which the disease was contracted on active service "Up Nile," but was not developed until after the return of the troops to Cairo.

As in the preceding year, the admission and death rates for Cairo are higher than those for Alexandria. Comparing the ratios for each station with those recorded for 1895, the admission and death rates in Cairo are lower by 5·6 and ·41, while those for Alexandria are higher by 2·1 and ·21 per 1,000 respectively.

As regards the cases which originated in Cairo, it is stated that no less than six were contracted in hospital from direct contact with patients. Excluding these cases, as well as those contracted up the Nile, it appears that the Abbasiyeh barracks furnished the majority of the admissions, but careful investigation failed to disclose any insanitary condition, and it is concluded that

Egypt and Cyprus.

drinking water, or beverages procured in the bazar, must be considered as the cause of the disease. The boiling of the water is carried out systematically, but it is pointed out that the soldiers prefer to drink unboiled water from a tap in preference to the boiled water, the taste of which they do not like. The cases referred to as having originated up the Nile were 47 in number, 13 proving fatal, and all were directly traced to the consumption of impure water, although every effort was made by the officers to restrain their men from drinking water other than that provided for them. Further information concerning the occurrence of enteric fever in the Dongola Expeditionary Force will be found in Appendix No. IV.

In Alexandria there was no insanitary condition within the barracks and lines that would account for the cases which occurred, and the troops are supplied with water from Pasteur-Chamberland filters. Attempts were made in each case, by inquiry into the movements and habits of the men, to trace the source of infection, but in only one instance could the probable cause be found, the man stating that he had frequented a drinking shop where the water supply was found to be very suspicious, situated not very far from Mustapha Camp. Six of the admissions came from Mustapha Camp, two from Ras-el-Tin, and two from the Red Barracks.

Tables are appended, taken from the report of the Principal Medical Officer, giving the admissions and deaths according to age and length of service in the Command, those which occurred in the men of the Dongola Expeditionary Force being shown in a separate column.

Ages.	Cairo and Alexandria.		Originating Up Nile.		Total.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Under 20 years - -	2	—	—	—	2	—
From 20 to 25 years -	35	5	40	11	75	16
„ 25 „ 30 „ -	12	4	7	2	19	6
„ 30 „ 35 „ -	1	—	—	—	1	—
„ 35 „ 40 „ -	—	1	—	—	—	1
Over 40 years - -	—	—	—	—	—	—
Total - -	50	10	47	13	97	23

Length of Service in Command.	Cairo and Alexandria.		Originating Up Nile.		Total.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Under 1 year - -	23	4	47	13	70	18
From 1 to 2 years -	18	3	—	—	18	2
„ 2 „ 3 „ -	6	3	—	—	6	3
„ 3 „ 4 „ -	3	—	—	—	3	—
„ 4 „ 5 „ -	—	—	—	—	—	—
„ 5 „ 10 „ -	—	—	—	—	—	—
Over 10 years - -	—	—	—	—	—	—
Total - -	50	10	47	13	97	23

As in former years, it is observed that the liability to attack is greatest among men between 20 and 25 years of age, and it is noted that recent arrival in the country largely predisposes to attack, a statement that is

Egypt and Cyprus.

exemplified by the fact that out of a total of 97 admissions and 23 deaths, 88 of the former and 20 of the latter occurred among men having less than two years' service in the commond.

Simple Continued Fever caused 222 admissions, or a ratio of 56·7 per 1,000, which is below that for 1895 by 7·8, and less than half the decennial average rate. The greatest prevalence of this fever was in Cyprus, the ratio being 85·9 per 1,000, while in Alexandria it was 61·5, and in Cairo 53·9. In the previous year Cairo gave the highest ratio, 70·6, followed by Alexandria with 48·3, and Cyprus with 45·5.

Cholera was very prevalent among the civil population, and 6 cases occurred among the troops, 5 at Cairo and 1 at Alexandria, all of which ended fatally. The Principal Medical Officer states that every precaution was taken, and it may reasonably be supposed that the disease was, in every instance, contracted outside barracks. There had been no case of cholera among the troops since 1883.

Dysentery was the cause of 48 admissions, most of which are ascribed to service up the Nile, and there were 2 deaths. The admission rate, 12·3 per 1,000, is below the previous year's rate and the average rate for the ten years 1886–95 by ·5 and 21·5 respectively. All but two of the cases, including those that were fatal, occurred at Cairo.

Other diseases of the first sub-group included 3 cases of mumps, 2 of influenza, and 1 of diphtheria.

Malarial Fevers.—Only 26 admissions are returned, all cases of ague. The ratio, 6·6 per 1,000, compares very favourably with the ratio of 47·5 in the previous year, and 24·9, the average rate. The disease appeared almost exclusively among men who had served in India.

Septic Diseases were represented by a single admission for erysipelas.

Venereal Diseases.—There were 312 admissions for *primary syphilis,* equal to a ratio of 79·7 per 1,000, which is above the ratios for 1895 and the ten years' average by 50·4 and 20·4 respectively. The number of men constantly sick was 27·40, the equivalent ratio being 7·00 per 1,000, as compared with 2·40 in the previous year and 4·99, the decennial average rate. If to this be added the sickness from simple venereal ulcer, for which there were 318 admissions and an average constant sickness of 24·95 men, the total ratio of admissions for primary venereal sores equalled 160·9 per 1,000, and that of constant inefficiency 13·37, the former being higher by 38·9 and 17·5, and the latter by 3·88 and 2·12, than the corresponding rates in 1895 and the average rate for the ten years 1886–95 respectively. *Secondary syphilis,* with 208 admissions and 22·19 men constantly sick, gave ratios of 53·1 and 5·66 per 1,000. The admission rate is lower than in the previous year by 3·9, but higher than the average for the preceding ten years by 14·0, while the constantly sick rate is higher in both comparisons by ·09 and 2·06 respectively. *Gonorrhœa* was the cause of 417 admissions, the average number constantly sick being 26·36. The admission ratio was 106·5, which is higher than that for 1895 by 8·2, but identical with the average rate for the ten years 1886–95. The constantly sick rate was 6·73 per 1,000, as compared with 6·94 in the previous year, and 7·10, the average rate. Taking all these forms of venereal disease together the total admission rate was 320·5 per 1,000, which is higher than that for the previous year by 43·2, and than the average rate for the preceding ten years by 31·5, the constantly sick rate, 25·76 per 1,000, being also higher in the two comparisons by 3·76 and 3·81. The diminution in the amount of venereal disease noted in 1895 has thus no longer been maintained. In Cairo the admission ratio for all classes of venereal disease was 299·0, and the constantly sick rate 23·77 per 1,000, these ratios being higher by 41·1 and 2·15 respectively than those recorded in the previous year. The corresponding ratios for Alexandria were 364·5 and 31·15, and those for Cyprus 507·8 and 34·30 per 1,000, the former being higher than in 1895 by 11·7 and 6·29*, and the latter by as much as 314·6 and 22·43 respectively.

Parasitic Diseases were represented by 11 admissions for tænia solium, of which 5 occurred in Cairo, 1 in Alexandria, and 5 in Cyprus.

---

* The increase in Alexandria is remarkable, as the city was placed out of bounds for several months of the year, during which period there was a marked diminution in the number of admissions for venereal disease. (*See* remarks below, under "Sanitary Conditions.")

Egypt and Cyprus.

For *alcoholism* there were 8 admissions, including 2 for delirium tremens, of which one proved fatal. In the previous year there were 7 admissions, of which 3 were returned as delirium tremens, with one death.

Debility, &c.—There were 76 cases admitted, the ratio being 19·4 per 1,000, which is higher than that for 1895 by 7·0, but lower than the decennial average rate by 6·3.

Rheumatism caused 95 admissions, or a ratio of 24·3 per 1,000, which is fractionally below the previous year's rate, and less than the average rate by 1·3. Of the cases, 7 were returned as rheumatic fever. There was no death.

Tubercular Diseases were the cause of 16 admissions and 6 deaths, all of which were tubercle of the lung. The admission rate was 4·1 per 1,000, which is higher by 1·5 than both the previous year's rate and the average for the ten years 1886–95. The death rate, 1·53 per 1,000, is higher in the two comparisons by ·89 and ·94 respectively. Of the cases, 6, with 3 deaths, occurred at Alexandria, and the remainder at Cairo.

Under the heading of *other diseases* of Group D. 26 cases are returned with 1 death, the admissions comprising 20 of non-malignant new growth and 2 each of malignant new growth, purpura, and anæmia. The death was due to malignant new growth.

LOCAL DISEASES.—*Diseases of the Nervous System.*—21 admissions are recorded, the ratio, 5·4 per 1,000, being below the previous year's rate and the average ratio for ten years by ·8 and 4·7 respectively. Neuralgia caused 15 admissions, epilepsy 5, and dementia 1.

Diseases of the Eye caused 71 admissions, equal to a ratio of 18·1 per 1,000, which is below the rate for 1895 and the decennial average rate by 3·5 and 23·6 respectively. All but 3 of the cases were returned as conjunctivitis.

Diseases of other Organs of Special Sense were the cause of 46 admissions, or a ratio of 11·7 per 1,000, which is less than that for the previous year and than the average rate for the preceding ten years by ·7 and 2·5 respectively. Inflammation of the external meatus accounted for 40 of the cases, and there was 1 admission for nasal affection.

Diseases of the Circulatory System.—There were 28 admissions, the equivalent ratio being 7·2 per 1,000, which is higher than that for 1895 by 1·0, but lower than the average rate for ten years by 3·4. The cases included 10 of palpitation, 7 of valvular disease of the heart, 5 of varix, 4 of phlebitis, and 2 of pericarditis. No death occurred.

Diseases of the Respiratory System.—99 admissions occurred with 2 deaths. The admission ratio, 25·3 per 1,000, is lower than the previous year's rate and than the average for the preceding ten years by 20·4 and 12·8 respectively. The cases are recorded as follows:—Bronchitis 62, pneumonia 23, pleurisy 8, asthma 4, and laryngitis and empyema one each. Both the deaths occurred at Cairo, and were due the one to bronchitis and the other to pneumonia.

Diseases of the Digestive System.—There were 418 admissions and 4 deaths, the admission ratio being 106·7 per 1,000, which is below that for 1895 and the decennial average rate by 5·3 and 35·3 respectively; 160 of the cases were due to affections of the mouth and throat, and among the remainder there were 109 cases of diarrhœa, 49 of dyspepsia, 33 of hepatic disorder, and 24 each of colic and piles. Of 4 cases of abscess of liver, all at Cairo, 3 proved fatal. Operative measures were taken in two cases, and recovery resulted in one of them. There was also a death from typhlitis.

Diseases of the Lymphatic and Glandular System caused 60 admissions, or a ratio of 15·3 per 1,000, which is below the previous year's rate and the average by 2·0 and 5·4 respectively. There were 55 admissions for inflammation and 4 for suppuration of the lymphatic glands, and 1 for goitre.

Diseases of the Urinary System caused only 3 admissions, viz., one each for nephritis, Bright's disease, and retention of urine, the ratio, ·8 per 1,000, comparing favourably with 2·1 in 1895, and 1·9, the average rate.

For *Diseases of the Generative System* there were 367 admissions, the equivalent ratio being 93·7 per 1,000, which is lower than that for 1895 and the average rate for the preceding ten years by 12·9 and 9·8 respectively. Simple venereal ulcer caused 318 of the admissions, and among the remainder there were 25 cases of orchitis and 12 of balanitis.

Diseases of the Organs of Locomotion.—There were 30 admissions, or 7·7 per 1,000, as compared with a ratio of 10·0 in 1895, and with 8·1, the decennial average rate. Most of the cases were returned as synovitis.

Diseases of the Connective Tissue gave an admission rate of 17·6 per 1,000, which is below the previous year's rate by 5·3 and the average rate by 9·0.

Diseases of the Skin caused 142 admissions, chiefly cases of boil, ulcer, eczema, whitlow, and itch, the equivalent ratio being 36·3 per 1,000, which is lower than the previous year's rate and the average rate by 12·2 and 17·6 respectively.

Poisons.—There were 3 admissions for poisoned wounds and one for poisoning by eating tinned (?) fish (salmon).

Injuries.—The admissions for general injuries were 12 in number, and there were 5 deaths. Nine of the admissions were returned as multiple injury, 3 ending fatally. In 8 of these cases the injuries were caused by falls, usually at night, from windows or verandahs. The ninth case was a man who had his legs nearly severed from the body by a train. Both legs were amputated in the lower third of the thigh, but the man never rallied and died in a few hours. The three remaining admissions under the head of "general injuries" were for heat apoplexy. All occurred in August, one of them ending fatally. There was also a death from heat apoplexy in the military prison. All these cases of general injury occurred in Cairo. There were 243 admissions for local injuries, and 2 deaths, the admissions including 74 cases of wounds, 64 of contusions, 58 of sprain, and 28 of fracture. One of the deaths was due to concussion of the brain caused by an accidental fall from horseback and the other to a gunshot wound of the head, self-inflicted, while the man was in a state of temporary insanity without any apparent cause. The total ratio of admission for injuries was 65·2 per 1,000 as compared with 95·1 in 1895, and 94·1, the average rate for the preceding ten years, the death rate, 1·79 per 1,000, being higher than in the previous year by ·51, but lower than the average by ·11.

Invaliding.—There were 36 men invalided home during the year, equal to a ratio of 9·19 per 1,000, which is below the previous year's rate and the average for the ten years 1886–95 by ·64 and 14·02 respectively. Twenty-nine of the invalids were from Cairo, or a ratio of 9·96 per 1,000 as compared with 10·80 in 1895, and 7 from Alexandria, the ratio, 7·97 per 1,000, being below that for the previous year by ·39. The highest invaliding rate in any arm of the service was 15·67 in the Artillery, which also gave the highest rate in the year before, followed by 12·02 in the Cavalry, 8·85 in the Engineers, 8·57 in the Infantry, and 3·32 in the Garrison Staff and Departments, the corresponding ratios in 1895 being 15·11, 7·87, 9·01, 9·37, and 12·70 respectively. In individual corps the highest ratio was 22·99 per 1,000 in the 32nd Field Battery, Royal Artillery, the next highest being 14·81 in the 2nd Dragoon Guards. There was no invaliding from the 1st Battalion North Staffordshire Regiment nor the Medical Staff Corps. Excluding these the lowest ratios were 5·12 in the 1st Battalion Gloucestershire Regiment, and 6·90 in the 16th Company, Eastern Division, Royal Artillery. As to the ages of the men invalided,* 1 man, or 5·68 per 1,000, was under 20 years of age, 19 men, or 8·36 per 1,000, were between 20 and 25, 11 men, or 9·74, were between 25 and 30, 4 men, or 19·34, were between 30 and 35, and 1 man, or 7·52 per 1,000, was over 35 years of age. A similar sequence of invaliding ratios obtained in the previous year. Compared with corresponding ratios for 1895 the invaliding for men between 20 and 25 years of age and over 35 years has decreased, but in all the other age groups it has increased. Taking service in the Command, 11 men, or 6·34 per 1,000, were in their first, 15, or 9·13 per 1,000, were in their second, 9 men, or 35·44 per 1,000, in their third year, and 1 man, or 22·73 per 1,000, had been more than 5 years in the Command. In the previous year the sequence was a gradual increase up to the fifth year of service, but amongst men of over five years' service there was no invaliding.

The principal causes of invaliding were diseases of the circulatory system 7 cases, or 1·79 per 1,000; tubercular disease of the lungs 5 cases, or 1·28 per 1,000; diseases of the eye and digestive disorders each 4 cases, or 1·02 per 1,000; and debility, &c. 3 cases, or ·77 per 1,000.

The number of men discharged the service as medically unfit was 29, the equivalent ratio being 7·40 per 1,000, which is below the previous year's rate and the decennial average rate by 2·21 and 7·47 per 1,000 respectively. The

---

* *See* Table on page 206.

Egypt and Cyprus.

chief causes of discharge were diseases of the circulatory system 7 cases, or 1·79 per 1,000; diseases of the nervous system 5 cases, or 1·28 per 1,000, including 3 cases, or ·77 per 1,000 of mental disorder; tubercular diseases and affections of the eye 4 cases each, or 1·02 per 1,000; and debility and injuries 2 cases each, or ·51 per 1,000.

Officers.—In an average strength of 141 there were 68 cases of sickness, 3 deaths, and 7 cases of invaliding. The corresponding ratios were 482·3, 21·28, and 49·64, as compared with 636·4, 6·49, and 58·57 per 1,000 respectively in 1895. The admissions included 22 for simple continued fever, 10 for injuries, and 4 for enteric fever. Two of the deaths were due to the last-named disease, and the third to fracture of the base of skull, the result of an accident at polo. All the cases of enteric fever occurred in Cairo, two having been contracted up the Nile. Three officers were invalided on account of simple continued fever, and one each on account of enteric fever, debility, neuralgia, and diarrhœa.

Women.—The average strength was 188, and there were 341 cases treated (exclusive of 43 of parturition), being in the ratio of 1813·8 per 1,000, which is higher than in 1895 by 593·6. There was 1 death, or 5·32 per 1,000, as compared with a ratio of 18·35 in the previous year. The cases included 1 each of small-pox and enteric fever, 53 of conjunctivitis, 33 of debility, 27 of simple continued fever, 19 of disorders of the generative system, and 11 of diarrhœa. There was one death; it occurred at Cairo, and was due to heat apoplexy.

Children.—There were 631 admissions and 12 deaths in an average strength of 359, the equivalent ratios being 1757·7 and 33·43 per 1,000, which are below those recorded for 1895 by 18·2 and 12·35 respectively. The principal causes of sickness were eruptive fevers 15 cases (chicken-pox 5, measles 8, and scarlet fever 2), simple continued fever 56, enteric fever 4, dysentery 4, debility 26, conjunctivitis 260, bronchitis 71, sore throat 33, and diarrhœa 49. The deaths were 5 from debility, 2 each from teething and enteritis, one from simple continued fever, and 2 from asphyxia (one of these being from submersion and the other from overlying).

Vaccination and Small-pox.—Two cases of small-pox occurred amongst the men and one amongst the women, all modified cases. Of 15 primary vaccinations with preserved lymph amongst the men, and 102 amongst children, 3 of the former and 37 of the latter were failures. There were 189 re-vaccinations with preserved lymph amongst men, 4 amongst women, and 13 amongst children, failures resulting in 144, 2, and 6 instances respectively. It is remarked that the calf lymph supplied appears to deteriorate very rapidly in Egypt.

Sanitary Conditions.—The Principal Medical Officer (Surgeon-Major General H. S. Muir, M.D.) reports that the sanitary condition of the various barracks and hospitals has been, on the whole, satisfactory. Considerable satisfaction is expressed in consequence of the comparative immunity of the troops from cholera, which was the cause of a widespread epidemic amongst the civil population. At Alexandria there was one case only, and at Cairo five. The former city was placed out of bounds for several months during the prevalence of the epidemic, and similar restrictions were also imposed upon the latter, though apparently of a less stringent character. The placing of Alexandria out of bounds is shown also to have had a very marked influence in diminishing venereal disease, the admission rate at Mustapha, for example, rising from 22 per 1,000 of strength to 60 per 1,000 on the removal of the restrictions. The Dongola Expedition is noted as having greatly influenced the health of the 1st Battalion North Staffordshire Regiment, which left Cairo for "Up Nile" in March in a very good state of health, and returned in October "quite unfit for any work on account of enteric fever, dysentery, and diarrhœa." Attention is directed in the reports to the prevalence of conjunctivitis amongst the children during the summer months, and to the impossibility of preventing it, except by some method of isolating the cases as they occur.

At Alexandria Pasteur-Chamberland filters have been installed into all the barracks. The water is supplied by the Alexandria Waterworks Company and is taken from the Mahmoudieh Canal, which is said to be greatly polluted. It is subjected to coarse filtration and treatment by permanganate of potash.

Egypt and Cyprus.

previous to distribution. Notwithstanding the introduction of the Pasteur filters into the barracks, it is noted that the number of admissions for enteric fever was the same as in the previous year; but it is pointed out that the cases were isolated cases, and that in all probability the disease was contracted outside barracks. The filters are reported to have worked in a most satisfactory manner, but the system of storing the water in "zeers" after filtration is considered objectionable. At Mustapha Camp a cowshed was fitted up within the barracks, and the milk to the troops was supplied from cows kept there under supervision. This worked well till the 23rd September, when arrangements were made to obtain milk from the Aboukir Dairy Farm situated 12 miles from the camp, and under European management. The milk is sent from the farm in sealed cans, which are opened in the regimental kitchen, and it is boiled before distribution. The canteen supplies at Mustapha were the subject of representation during the year. Several cases of colic and diarrhœa were attributed to tinned fish, the condensed milk was considered inferior, and, owing to the necessity of keeping hawkers out of barracks, the families had not the usual facilities for obtaining from the canteen fresh vegetables according to individual requirements. In connexion with conservancy arrangements it is noted that the dry earth for the latrines is exposed to wet, and that the method adopted of emptying the foul water catch-pits by buckets and hand labour is objectionable. Amongst improvements effected during the year at Mustapha Camp it is reported that the roofs of the married and officers' quarters were repaired, the kitchen of the sergeants' mess generally improved, and three new quarters for warrant officers taken over. The general sanitary condition of the Ras-el-Tin and other barracks in Alexandria is considered satisfactory, and nothing of importance is noted with regard to them.

At Cairo the means of purifying the water supply are not considered so satisfactory as in Alexandria. The water is obtained from the Nile through the Cairo Waterworks Company, the intake being below the Kasr-el-Nil barracks and other inhabited parts of the city, and it is stated that no effective method of general filtration exists. In barracks Pasteur and Berkfeld filters are only in partial use, but they have been supplied to each division of the Station Hospital, to the Women's Hospital, to the mineral-water factories, to one of the barrack rooms in the citadel and to the headquarters building and sergeants' messes in the Kasr-el-Nil barracks. Where there are no filters of this description the water is boiled, but it is noted that boiled water is unpalatable, and does not find favour with the troops. Most of the cases of enteric, it is observed, occurred in the Abbasiyeh barracks, where there were no Pasteur filters. Several improvements were effected in the various barracks during the year. At the citadel new brick latrines were constructed, and the lighting and ventilation of the married quarters improved. A ventilated boarded floor was provided to one of the blocks. The new drainage system of the citadel works satisfactorily, except in the method of disposal of the foul water, difficulty occurring in obtaining proper percolation from the absorption pits. At Kasr-el-Nil barracks the drainage, which formerly discharged into the Nile above the intake of the waterworks, was diverted into a large percolating cesspit, on account of objections raised by the Egyptian Sanitary Department. "The cesspit performed its function well," as the Nile was exceptionally low during the year; but it is anticipated that the soil will become saturated, and the pit cease to act, when the Nile rises above its usual level. The foul water from the married quarters is conveyed to tanks, which are emptied twice daily. The barrack square is being raised, as its level is below that of the river when in flood. A tendency to overcrowding is noted in the married quarters. At Abbasiyeh a new drainage scheme has been sanctioned. The old latrines are being reconstructed, and the stone floors replaced by asphalt. The barracks generally are stated to be old and badly constructed, difficult to keep clean, and defective in means of external ventilation.

The health of the troops in Cyprus was considered satisfactory. Small-pox was prevalent in Limassol and neighbouring districts, but no cases occurred amongst the troops. It is noted that syphilis of a severe type was also prevalent at Limassol. There were no cases of enteric fever during the year, and, it is noted, intemperance was extremely rare. The sanitary conditions

Egypt and Cyprus.

generally both at Polymedia and Troodos were satisfactory. A dry-earth system of conservancy is in use, and the water supply in both stations is considered extremely pure and good. At Polymedia it is obtained from a mountain spring, 4 miles distant, and conveyed in earthenware pipes to a covered tank in the camp; at Troodos it is from a spring in a valley, half a mile from the camp, and is pumped up by a steam force pump to large iron tanks, from which it is distributed by means of stand pipes. Polymedia was occupied from 1st January to 31st May, and from 13th November to the end of the year. During the rest of the year the troops were at Troodos.

XV.—ON THE HEALTH OF THE TROOPS ON BOARD SHIP.

Troops on Board Ship.

The troops embarked during the year, as shown by the returns received at head-quarters, were:—

I.	Troops proceeding on service abroad - - -	19,163
II.	Troops returning from abroad - - - -	14,336
III.	Troops proceeding from one station abroad to another	10,469
IV.	Invalids returning to England - - -	2,324

I.—TROOPS PROCEEDING ON SERVICE ABROAD.

The total number of warrant officers, non-commissioned officers and men embarked for foreign service during the year was 19,163, the equivalent annual strength being 1,131. There were 1,114 admissions into hospital, and one death, being in the annual ratios of 985·0 and ·88 per 1,000 respectively. Compared with corresponding ratios in the preceding year, decrease is observed in the admission and death rates of 52·6 and ·11 respectively, and in comparison with similar average ratios for the previous ten years there is a decrease of 133·3 in the former and one of 2·71 in the latter.

The admissions and deaths according to the different groups and orders of diseases are shown in Abstract XXII.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—There were 6 admissions for *eruptive fevers,* two being due to scarlet fever, three to measles, and one to cow-pox.

Enteric fever caused two admissions. The first case occurred on H.M.S. "Malabar" on her voyage to India, in March, and was supposed to have originated at Portland; the second case was on board the transport "Victoria," which left for India in November, and occurred a few days after sailing from Queenstown. *Other continued fevers* gave 24 admissions, with a ratio of 21·2 per 1,000, which is higher by 7·4 than the corresponding rate in the previous year. The admission under the heading of *other diseases* of the 1st sub-group was for mumps.

Three admissions under the head of *malarial fevers* were all due to ague, while under *septic diseases* no admission is recorded.

Venereal Diseases.—For *primary syphilis* the admissions numbered 130, giving a ratio of 114·9 per 1,000 or 22·8 in excess of the previous year's ratio. Including 46 cases of simple venereal ulcer, the ratio equals 155·6, or 6·1 above the ratio for 1895. *Secondary syphilis* caused 38 admissions, equal to a ratio of 33·6 per 1,000, or 4·9 above the rate in the previous year. *Gonorrhœa* gave 328 admissions with a ratio of 290·0 per 1,000, showing an excess of 57·3 on the ratio for 1895. Including all forms of venereal disease, the ratio of admission equalled 479·2 per 1,000, being an increase of 68·3 on the corresponding ratio for the previous year.

Alcoholism.—Three admissions are shown under this head. Seven cases of *debility* are recorded. *Rheumatism* was the cause of 15 admissions, equal to a ratio of 13·3 per 1,000, showing a decrease of 11·4, on the preceding year's ratio. *Tubercular diseases* gave a single admission, and *other diseases* of Group D were represented by 17 cases of non-malignant new growth, and by one case of anæmia.

LOCAL DISEASES.—*Diseases of the nervous system* caused 10 admissions, or 8·8 per 1,000, being higher than the ratio for the previous year by 3·9. Of the cases, 6 were shown as neuralgia and 4 as epilepsy.

Diseases of the eye gave 13 admissions, including 7 cases of conjunctivitis, and diseases of *other organs of special sense* 7 admissions, all but one being for aural affections. The ratios under these heads were 11·5 and 6·2 per 1,000 respectively, as compared with 16·8 and 4·0 in 1895.

Troops on Board Ship.

For *diseases of the circulatory system* 5 admissions are recorded, the ratio per 1,000 being 4·4, or an increase of 3·4 on that of the previous year. *Respiratory diseases* gave 41 admissions, equal to a ratio of 36·3 per 1,000, or 64·7 below the corresponding ratio for 1895. The cases comprised 21 of bronchial affections, as compared with 94 during the previous year; 17 of pneumonia, as compared with 5; 2 of pleurisy, and 1 of asthma. For *diseases of the digestive system* there were 169 admissions, giving a ratio per 1,000 of 149·4, an increase of 25·6 on that of the preceding year. Throat and mouth affections were the cause of 56 of the admissions and constipation and diarrhœa contributed the greater number of the remaining cases. *Diseases of the lymphatic and glandular system* caused 20 admissions, the rate per 1,000 being 17·7, as compared with 22·8 in the preceding year. Under the head of *urinary diseases* only 2 admissions are shown, namely, from incontinence of urine and nephritis. *Diseases of the generative system* were the cause of 66 admissions, and the ratio per 1,000 was 58·4. This is a decrease of 40·6 in comparison with 1895. Simple venereal ulcer was the chief cause of admissions under this heading, balanitis and orchitis accounting for the next greatest number. For *diseases of the organs of locomotion* there were 4 admissions, the ratio, 3·5 per 1,000, being below that of the previous year by 1·4. *Diseases of the connective tissue,* with an admission rate of 22·1 per 1,000, show a decrease compared with the previous year's rate of 12·6. *Diseases of the skin* were the cause of 92 admissions, principally caused by itch, boils, whitlow, eczema, and ulcers; the ratio per 1,000, 81·3, showing a decrease of 19·7, in comparison with the corresponding ratio in 1895. There were 83 admissions for *injuries,* the ratio per 1,000 being 73·3, a decrease of 11·9 as compared with that for the preceding year. 4 of the cases are shown under the head of general injury and were all due to heat apoplexy, or sunstroke. Of the 79 cases of local injury, wounds and sprains were the chief causes of admission. There was one fatal injury, due to concussion of the spine, caused by a fall during a heavy sea. The accident occurred on ss. "Spartan" in December when three days out from Southampton.

The number of officers embarked was 840, among whom 13 cases of sickness occurred.

The number of women embarked was 881, no casualties occurring amongst them. There were 3 deaths amongst children, of whom 1,129 were embarked. The causes of the 3 deaths were hydrocephalus, pneumonia, and asphyxia (from over-lying).

II.—TROOPS RETURNING HOME FROM ABROAD.

The number of effective warrant officers, non-commissioned officers and men who embarked for England was 14,336, the equivalent annual strength being 953. The admissions into hospital numbered 1,075, and there were 9 deaths, equal to ratios of 1,128·0 and 9·44 per 1,000, and showing increase of 192·9 and 4·04 per 1,000 respectively, as compared with the admission and death rates in the preceding year. In comparison with corresponding ratios for the previous ten years, there is a decline of 3·4 in the admission rate, and one of 1·69 in that of mortality.

The admissions and deaths in the different groups and orders of diseases are shown in Abstract XXII.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—There were 3 admissions for *eruptive fevers,* two being for dengue and one for scarlet fever. *Enteric fever* caused two admissions, one of which terminated fatally. The first case occurred on board the "Britannia" in October, and was supposed to have been contracted in India prior to embarkation; the second case, which proved fatal, took place on the transport "Victoria" on passage from India, in December, and was, it is stated, "probably contracted on the journey down country." *Simple continued fever* was the cause of 9 admissions, and the ratio per 1,000, 9·5, shows a slight increase when compared with the corresponding ratio for the preceding year. For *dysentery* the admissions numbered 10, one of the cases proving fatal; the ratio of the admissions equalled 10·5, or 3·5 lower than the ratio for the previous year.

Troops on Board Ship.

Malarial Fevers.—353 admission are recorded under this head, the equivalent ratio per 1,000 being 370·4, or 242·8 above the previous year's rate for these diseases. Of the cases, 218 are shown as remittent fever. Of this large number of admissions 212 occurred on the voyage from Cape Coast Castle among the men returning from the Ashanti Expedition. Ague contributed 135 cases, and was also influenced by the Ashanti Expedition, 20 of the cases occurring amongst troops coming home from Cape Coast Castle. The 3 deaths shown under this heading were all due to remittent fever, two of the men being homeward bound from Ashanti.

Septic Diseases were represented by 3 cases of erysipelas, all on different vessels, one proving fatal.

Venereal Diseases.—Primary syphilis caused 82 admissions, giving an annual ratio of 86·0 per 1,000, which is below the previous year's rate by 63·2. Including cases of simple venereal ulcers, of which there were 47, the ratio of admissions for primary venereal sores equalled 135·3, showing a decline of 71·2 on the preceding year's ratio. *Secondary syphilis* caused 57 admissions, the ratio per 1,000 being 59·8, or 5·7 in excess of the ratio for 1895, while *gonorrhœa*, with 178 admissions, and a ratio of 186·8 per 1,000, shows a decline of 11·0. Including all forms of venereal diseases, the total admission rate was 381·9 per 1,000, as compared with 458·4 in the previous year. The remaining admissions for general diseases were 1 for scurvy, 3 for debility, 14 for rheumatism—with a ratio of 14·7 per 1,000, showing a decline of 14·5 on that for 1895—3 for tubercle of lung, and 2 for non-malignant new growth.

LOCAL DISEASES.—Under *diseases of the nervous system* 4 admissions are recorded, 3 being for neuralgia and 1 for mania. *Diseases of the eye* contributed 15 cases, all but two being due to conjunctivitis; and *aural diseases* were represented by 3 cases of inflammation of external meatus. There was no admission under *diseases of the circulatory system. Diseases of the respiratory system* gave 60 admissions and 2 deaths; the admission rate, 63·0, shows a decline of 10·5 as compared with that for the preceding year. The cases included 42 of bronchitis and 14 of pneumonia, both deaths being due to the latter disease. *Diseases of the digestive system,* with 66 admissions, and a ratio of 69·3 per 1,000, shows an increase of 18·5 over the previous year's ratio, diarrhœa and hepatic disorders being the most frequent causes of sickness. One death occurred from abscess of liver. There were 23 admissions under *diseases of the lymphatic and glandular system,* the ratio, 24·1 per 1,000, being below the ratio for the previous year by 1·8; while *diseases of the generative system,* with 62 admissions, gave a ratio of 65·1 per 1,000, which is less than in 1895 by 3·0. Most of the cases have been referred to under the heading of venereal diseases. *Diseases of the connective tissue* caused 27 admissions, with a ratio of 28·3 per 1,000, or 2·4 higher than in the previous year, and *diseases of the skin,* with 43 admissions, chiefly caused by ringworm, ulcers, and boils, show a ratio of 45·1 per 1,000, which is lower than in the previous year by 1·4.

Injuries.—Under *general injury* 5 cases of heat apoplexy are recorded. All these cases occurred on the transport "Britannia" in October while in the Red Sea; no death resulted. *Local injuries* caused 37 admissions, mostly for wounds, contusions, and sprains. The total ratio of admission for injuries was 44·1 per 1,000 as compared with 33·5 in 1895.

The number of officers who embarked was 676, among whom there were 67 cases of sickness, with no deaths. Among 742 women embarked there were 4 deaths, namely, from tubercle of lung, abscess of liver, secondary syphilis, and acute meningitis. Among children there were 3 deaths, 2 from debility and 1 from inflammation of stomach, the number embarked being 1,690.

III.—TROOPS PROCEEDING FROM ONE STATION ABROAD TO ANOTHER.

The number of warrant officers, non-commissioned officers, and men who embarked for passage between one station abroad and another was 10,469, the equivalent annual strength being 464, among whom there were 526 admissions into hospital and 2 deaths, the ratio of admission being 1133·6, and that of mortality 4·31 per 1,000. These ratios are lower than the corresponding ratios in 1895 by 1·5 and 3·75, and than the average ratios for the preceding 10 years by 134·3 and ·80 respectively.

Troops on Board Ship.

The admissions, arranged according to the different groups and orders of diseases, are shown in Abstract No. XXII.

GENERAL DISEASES.—*Diseases dependent on Morbid Poisons.*—One case each of measles and scarlet fever is recorded under *eruptive fevers,* and there were 7 admissions for *simple continued fever.* One case of *enteric fever* occurred on the ship "Pavonia" in February, the patient embarking at Mauritius, where the disease was probably contracted.

Malarial fevers were the cause of 62 admissions and 1 death, 55 of the cases being due to ague, and the remainder, including the fatal case, to remittent fever; the admission rate, 133·6 per 1,000, exceeded that for 1895 by 44·9.

Venereal Diseases.—*Primary syphilis* caused 21 admissions, or a ratio of 45·3 per 1,000, which is lower than the previous year's rate by 182·5. If to this be added the sickness from simple venereal ulcer, for which there were 65 admissions, the rate of admission for primary venereal sores equals 185·4 per 1,000, a ratio lower than that of the previous year by 149·2. *Secondary syphilis,* with 13 cases, gave a ratio of 28·0, as compared with 30·3 in the preceding year. For *gonorrhœa* there were 160 admissions, the ratio, 344·8 per 1,000, being higher than that for 1895 by 14·2. Taking all forms of venereal disease together, the total admission rate was 558·2 per 1,000, or 137·3 lower than in 1895.

In addition to the foregoing the admissions among general diseases were 6 for debility, 7 for rheumatism, and 18 for non-malignant new growth.

LOCAL DISEASES.—*Nervous affections* were not represented, while under *diseases of the eye* 5 cases are recorded, 4 being due to conjunctivitis. The admissions under the heading of *aural diseases* were all due to inflammation of the external meatus. There was no admission for *diseases of the circulatory system. Respiratory affections,* with 13 admissions, gave a ratio of 28·0 per 1,000, or 11·9 higher than in 1895. There were 8 cases of bronchitis, 4 of pneumonia, and 1 of pleurisy. *Diseases of the digestive system* caused 20 admissions, including 5 for diarrhœa and 4 for hepatic disorders, the ratio, 43·1 per 1,000, being lower than that for the preceding year by 1·3. The solitary admission under *urinary disorders* was due to cystitis. The 92 cases returned among *diseases of the generative system* are accounted for by 65 cases of simple venereal ulcer, previously referred to, 23 of balanitis, 3 of orchitis, and 1 of varicocele. The ratio of admissions under this heading is 198·3 per 1,000, which is higher than that for the previous year by 75·3. *Diseases of the organs of locomotion* contributed 6 admissions, of which 5 were for synovitis and 1 for inflamed bursa. *Skin diseases,* with 20 admissions, of which all but three were for boils, ulcers, and eczema, furnished a ratio of 43·1 per 1,000, as compared with 30·3 in the previous year.

Injuries.—There were 22 admissions under this heading, including one case of heat apoplexy, which occurred on the ss. "Pavonia" in February two days before the vessel arrived at Bombay. The other injuries were all of a local character, and included 8 cases of wound, 4 cases each of sprain and fracture, 3 of contusion, and 2 of burns and scalds, the total giving a ratio of 47·5 per 1,000, which is lower than in the year preceding by 31·1.

Among 230 officers embarked 6 cases of sickness came under treatment. 241 women were embarked and 468 children, one death from valvular disease of the heart occurring among the latter.

IV.—INVALIDS RETURNING TO ENGLAND.

The number of invalids embarked for England from foreign stations was 2,324, equal to an annual strength of 151. There were 15 deaths during the voyage home. The sickness and mortality among these invalids are accounted for in the statistical tables of the Commands from which they were invalided.

V.—SANITARY CONDITION OF SHIPS.

The sanitary condition of the different vessels and the accommodation provided for the troops on the various voyages were generally reported to be satisfactory.

ABSTRACTS.

ABSTRACT No. I.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS among the TROOPS serving in the UNITED KINGDOM during the Year 1896,

Average Strength in Annual Returns, 99,821.
Average Strength, including Men detached, 102,476.

Diseases.	Admissions into Hospital.	Died: With the Regiment.	Died: Absent from the Regiment.	Died: Total.	Invalids Discharged the Service.
I.—GENERAL DISEASES.					
GROUP "A."					
Sub-Group I. Small-pox	1	—	—	—	—
Other Eruptive Fevers	904	7	—	7	—
Enteric Fever	94	20	2	22	—
Other Continued Fevers	293	—	—	—	—
Yellow Fever	—	—	—	—	—
Cholera	—	—	—	—	—
Dysentery	46	1	—	1	8
Other Diseases	538	2	—	2	—
Total	1,876	30	2	32	8
Sub-Group II.—Malarial Fevers	806	2	—	2	9
Sub-Group III.—Septic Diseases	93	5	—	5	—
Sub-Group IV. Syphilis, Primary	4,344	—	—	—	—
„ Secondary	3,225	5	—	5	134
Gonorrhœa	6,867	—	—	—	10
Total	14,436	5	—	5	144
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—
GROUP "B."					
Sub-Group I.—Parasitic Diseases	20	—	—	—	—
Sub-Group II. Scurvy	6	—	—	—	—
Alcoholism	147	5	—	5	—
GROUP "C."					
Debility, &c.	737	1	—	1	114
GROUP "D."					
Rheumatism	2,901	4	1	5	91
Tubercular Diseases	264	56	6	62	167
Other Diseases	433	15	3	18	36
II.—LOCAL DISEASES.					
Diseases of the—					
1. Nervous System Nervous Diseases	646	19	1	20	126
Mental „	119	2	—	2	109
2. Eye	1,057	—	—	—	84
3 & 4. Other Organs of Special Sense	818	1	—	1	132
5. Circulatory System	1,159	35	1	36	511
6. Respiratory „	3,876	64	5	69	67
7. Digestive „	9,398	26	2	28	145
8. Lymphatic and Glandular System	1,253	1	—	1	15
9. Urinary System	215	9	—	9	45
10. Generative „	2,445	—	—	—	30
11. Organs of Locomotion	1,159	2	—	2	211
12. Connective Tissue	2,700	1	—	1	6
13. Skin	6,982	—	—	—	32
III.—POISONS	15	6	—	6	—
IV.—INJURIES.					
1. General	37	20	2	22	1
2. Local	10,489	34	1	35	90
3. In Action	—	—	—	—	—
No appreciable disease	308	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—
General Total	64,395	343	24	367	2,173

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Average Number constantly Sick.	Ratio per 1,000.				Average Ratio per 1,000 from 1886 to 1895.			
	Admissions.	Deaths.*	Invalids Discharged the Service.*	Constantly Sick.	Admissions.	Deaths.*	Invalids Discharged the Service.*	Constantly Sick.
·20	—	—	—	—	·1	—	—	·01
74·03	9·1	·07	—	·74	8·3	·05	—	·60
16·74	·9	·21	—	·17	1·3	·27	—	·22
10·28	2·9	—	—	·10	4·7	·02	—	·18
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
4·68	·5	·01	·08	·05	·6	·02	·04	·06
26·18	5·4	·02	—	·26	17·3	·05	—	·50
132·11	18·8	·31	·08	1·32	32·3	·42	·04	1·57
34·50	8·1	·02	·09	·34	6·0	·01	·02	·21
6·00	·9	·05	—	·06	2·0	·08	·01	·13
428·96	43·5	—	—	4·30	63·6	—	·01	5·93
348·93	32·3	·05	1·30	3·49	36·0	·05	·79	3·47
501·84	68·8	—	·10	5·03	90·6	—	·05	6·08
1279·73	144·6	·05	1·40	12·82	190·2	·05	·85	15·48
—	—	—	—	—	—	—	—	—
·54	·2	—	—	·01	·4	·01	—	·01
·42	·1	—	—	—	·1	—	—	—
5·55	1·5	·05	—	·06	2·4	·03	·01	·07
52·19	7·4	·01	1·11	·52	7·2	·01	·92	·50
193·46	29·1	·05	·89	1·94	35·7	·05	·65	2·24
38·78	2·6	·61	1·63	·39	3·4	·90	1·70	·55
34·74	4·3	·18	·35	·35	5·0	·11	·38	·40
47·90	6·5	·20	1·23	·48	7·4	·33	1·15	·50
19·58	1·2	·02	1·06	·20	1·4	·01	·92	·24
61·62	10·6	—	·82	·62	11·7	—	·69	·71
58·93	8·2	·01	1·29	·59	7·7	·01	·77	·48
117·25	11·6	·35	4·99	1·17	9·6	·39	3·32	·93
198·82	38·8	·67	·65	1·99	64·1	1·27	·88	3·20
300·67	94·2	·27	1·41	3·01	106·3	·34	·95	3·21
140·12	12·6	·01	·15	1·40	16·6	·01	·11	1·76
22·68	2·1	·09	·44	·23	2·3	·16	·26	·20
167·65	24·5	—	·29	1·68	36·9	·01	·29	2·37
85·28	11·6	·02	2·06	·85	7·8	·03	·95	·62
112·51	27·0	·01	·06	1·13	23·3	·02	·08	1·05
283·83	69·9	—	·31	2·84	74·2	—	·20	2·78
·68	·1	·06	—	·01	·1	·04	—	—
1·93	·4	·21	·01	·02	·2	·36	·01	·01
435·67	105·1	·34	·88	4·37	97·6	·33	·74	4·03
—	—	—	—	—	—	—	—	—
11·77	3·1	—	—	·12	3·1	—	—	·09
—	—	—	—	—	—	—	—	—
3844·93	645·1	3·58	21·20	38·52	755·0	4·98	15·90	43·34

* These ratios are calculated on the strength including men detached.

ABSTRACT A.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS among the TROOPS stationed in ENGLAND during the Year 1896, with

Average Strength in Annual Returns, 72,674. Average Strength, including Men detached, 74,043.	Admissions into Hospital.	Died			Invalids Discharged the Service.	Average Number constantly Sick.
Diseases.		With the Regiment.	Absent from the Regiment.	Total.		
I.—GENERAL DISEASES.						
GROUP "A."						
Sub-Group I.						
Small-pox	1	—	—	—	—	·20
Other Eruptive Fevers	736	5	—	5	—	61·47
Enteric Fever	45	6	2	8	—	8·19
Other Continued Fevers	174	—	—	—	—	6·43
Yellow Fever	—	—	—	—	—	—
Cholera	—	—	—	—	—	—
Dysentery	33	1	—	1	5	3·16
Other Diseases	363	2	—	2	—	16·58
Total	1,352	14	2	16	5	96·03
Sub-Group II.—Malarial Fevers	720	2	—	2	7	30·92
Sub-Group III.—Septic Diseases	69	5	—	5	—	4·48
Sub-Group IV.						
Syphilis, Primary	3,447	—	—	—	—	342·43
„ Secondary	2,521	5	—	5	112	282·73
Gonorrhœa	5,148	—	—	—	9	375·29
Total	11,116	5	—	5	121	1000·45
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—
GROUP "B."						
Sub-Group I.—Parasitic Diseases	16	—	—	—	—	·42
Sub-Group II. Scurvy	6	—	—	—	—	·42
Alcoholism	96	4	—	4	—	3·57
GROUP "C."						
Debility, &c.	516	1	—	1	84	38·24
GROUP "D."						
Rheumatism	2,212	2	1	3	70	151·83
Tubercular Diseases	185	41	3	44	112	26·55
Other Diseases	318	11	3	14	28	26·02
II.—LOCAL DISEASES.						
Diseases of the—						
1. Nervous System, Nervous Disease	478	15	1	16	97	36·20
Mental „	94	1	—	1	83	14·06
2. Eye	750	—	—	—	57	43·55
3 & 4. Other Organs of Special Sense	597	—	—	—	92	42·41
5. Circulatory System	776	23	1	24	345	81·48
6. Respiratory „	2,859	49	4	53	50	151·10
7. Digestive „	7,031	15	2	17	99	223·01
8. Lymphatic and Glandular System	965	1	—	1	12	113·44
9. Urinary System	135	8	—	8	27	14·17
10. Generative „	1,741	—	—	—	22	119·95
11. Organs of Locomotion	826	2	—	2	143	62·36
12. Connective Tissue	1,957	—	—	—	4	78·99
13. Skin	4,886	—	—	—	24	202·25
III.—POISONS	14	6	—	6	—	·64
IV.—INJURIES.						
1. General	32	15	—	15	1	1·64
2. Local	7,356	28	1	29	64	312·57
3. In Action	—	—	—	—	—	—
No appreciable disease	258	—	—	—	—	10·28
Cause unknown (refers to deaths only)	—	—	—	—	—	—
General Total	47,360	248	18	266	1,547	2387·03

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.				Average Ratio per 1,000 from 1886 to 1895.			
Admissions.	Deaths.*	Invalids Discharged the Service.*	Constantly Sick.	Admissions.	Deaths.*	Invalids Discharged the Service.*	Constantly Sick.
—	—	—	—	·1	—	—	·01
10·1	·07	—	·85	9·8	·05	—	·73
·7	·11	—	·11	1·0	·20	—	·16
2·4	—	—	·09	4·0	·02	—	·16
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
·4	·01	·07	·04	·8	·03	·04	·08
5·0	·03	—	·23	18·9	·05	—	·56
18·6	·22	·07	1·32	34·6	·35	·04	1·70
9·9	·03	·10	·43	7·2	·01	·02	·26
·9	·07	—	·06	2·1	·09	·01	·14
47·4	—	—	4·71	68·9	—	·01	6·47
34·7	·07	1·51	3·89	38·9	·05	·56	3·83
70·9	—	·12	5·16	93·7	—	·05	6·34
153·0	·07	1·63	13·76	201·5	·05	·92	16·64
—	—	—	—	—	—	—	—
·2	—	—	·01	·5	·01	—	·01
·1	—	—	·01	—	—	—	—
1·3	·05	—	·05	2·5	·04	—	·08
7·1	·01	1·13	·53	7·4	·01	·62	·51
30·4	·04	·95	2·09	37·7	·06	·67	2·39
2·3	·59	1·51	·36	3·5	·91	1·77	·56
4·4	·19	·33	·36	5·2	·11	·42	·42
6·6	·22	1·31	·50	7·6	·35	1·19	·52
1·3	·01	1·12	·19	1·2	·01	·85	·22
10·3	—	·77	·60	11·7	—	·71	·70
8·2	—	1·24	·58	8·1	·01	·83	·51
10·7	·32	4·66	1·12	9·9	·40	3·55	·98
39·3	·72	·68	2·08	65·7	1·33	·89	3·26
96·8	·23	1·34	3·07	111·2	·36	1·00	3·38
13·3	·01	·16	1·56	17·5	·01	·11	1·88
1·8	·11	·37	·19	2·3	·16	·25	·20
24·0	—	·30	1·65	37·9	·01	·31	2·52
11·4	·03	1·93	·86	7·5	·03	1·02	·62
26·9	—	·05	1·09	23·3	·02	·09	1·07
67·2	—	·32	2·78	75·3	—	·20	2·80
·2	·08	—	·01	·1	·05	—	—
·4	·20	·01	·02	·2	·33	·0	·02
101·2	·39	·86	4·30	96·4	·32	·79	4·04
—	—	—	—	—	—	—	—
3·6	—	—	·14	3·4	—	—	·10
—	—	—	—	—	—	—	—
651·7	3·59	20·89	39·72	781·5	5·03	16·57	45·53

* These ratios are calculated on the strength including men detached.

ABSTRACT B.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS among the TROOPS stationed in SCOTLAND during the Year 1896, with

Average Strength, in Annual Returns, 3,530.	Admissions into Hospital.	Died			Invalids Discharged the Service.	Average Number constantly Sick.
Diseases.		With the Regiment.	Absent from the Regiment.	Total.		
I.—GENERAL DISEASES.						
GROUP "A."						
Sub-Group I.						
Small-pox	—	—	—	—	—	—
Other Eruptive Fevers	57	—	—	—	—	4·32
Enteric Fever	2	2	—	2	—	·30
Other Continued Fevers	18	—	—	—	—	·41
Yellow Fever	—	—	—	—	—	—
Cholera	—	—	—	—	—	—
Dysentery	—	—	—	—	—	·23
Other Diseases	17	—	—	—	—	·43
Total	94	2	—	2	—	5·69
Sub-Group II.—Malarial Fevers	6	—	—	—	—	·08
Sub-Group III.—Septic Diseases	2	—	—	—	—	·10
Sub-Group IV.						
Syphilis, Primary	72	—	—	—	—	5·84
„ Secondary	99	—	—	—	5	6·45
Gonorrhœa	227	—	—	—	—	13·17
Total	398	—	—	—	5	25·46
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—
GROUP "B."						
Sub-Group I.—Parasitic Diseases	—	—	—	—	—	—
Sub-Group II.						
Scurvy	—	—	—	—	—	—
Alcoholism	6	—	—	—	—	·12
GROUP "C."						
Debility, &c.	17	—	—	—	7	·84
GROUP "D."						
Rheumatism	87	—	—	—	1	4·09
Tubercular Diseases	8	3	—	3	4	·83
Other Diseases	13	—	—	—	—	·42
II.—LOCAL DISEASES.						
Diseases of the—						
1. Nervous System — Nervous Disease	15	—	—	—	5	·91
1. Nervous System — Mental „	2	—	—	—	1	·59
2. Eye	34	—	—	—	4	1·61
3 & 4. Other Organs of Special Sense	16	—	—	—	3	1·03
5. Circulatory System	17	3	—	3	12	1·24
6. Respiratory „	143	2	—	2	4	5·76
7. Digestive „	266	1	—	1	5	6·53
8. Lymphatic and Glandular System	33	—	—	—	1	1·65
9. Urinary System	10	—	—	—	1	·56
10. Generative „	88	—	—	—	1	4·87
11. Organs of Locomotion	45	—	—	—	10	1·64
12. Connective Tissue	83	—	—	—	—	3·70
13. Skin	226	—	—	—	2	6·73
III.—POISONS	—	—	—	—	—	—
IV.—INJURIES.						
1. General	—	1	1	2	—	—
2. Local	337	2	—	2	6	9·89
3. In Action	—	—	—	—	—	—
No appreciable disease	10	—	—	—	—	·26
Cause unknown (refers to deaths only)	—	—	—	—	—	—
General Total	1,956	14	1	15	72	84·60

into Hospital, Deaths, Numbers Invalided and Constantly Sick the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.				Average Ratio per 1,000 from 1886 to 1895.			
Admissions.	Deaths.*	Invalids Discharged the Service.*	Constantly Sick.	Admissions.	Deaths.*	Invalids Discharged the Service.*	Constantly Sick.
—	—	—	—	·1	—	—	·01
16·1	—	—	1·22	4·9	—	—	·30
·6	·57	—	·09	·8	·11	—	·11
5·1	—	—	·12	6·4	—	—	·16
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	·06	·3	—	·05	·02
4·8	—	—	·12	8·8	·08	—	·22
26·6	·57	—	1·61	21·3	·19	·05	·82
1·7	—	—	·02	2·9	—	·08	·07
·6	—	—	·03	2·6	·11	—	·14
20·4	—	—	1·65	31·7	—	—	2·58
28·0	—	1·42	1·83	29·4	·03	1·01	2·10
64·3	—	—	3·73	73·4	—	·08	3·85
112·7	—	1·42	7·21	134·5	·03	1·09	8·53
—	—	—	—	—	—	—	—
—	—	—	—	·6	—	—	·01
—	—	—	—	·2	—	·03	·01
1·7	—	—	·03	2·9	·08	—	·07
4·8	—	1·98	·24	5·3	—	1·12	·32
24·6	—	·28	1·16	26·5	·05	1·23	1·53
2·3	·85	1·13	·24	3·1	·84	1·36	·33
3·7	—	—	·12	3·5	·16	·27	·18
4·3	—	1·42	·26	6·6	·38	1·01	·38
·6	—	·28	·17	1·9	—	·82	·25
9·6	—	1·13	·46	9·5	—	·84	·47
4·5	—	·85	·29	5·5	·03	·71	·24
4·8	·85	3·40	·35	8·9	·44	3·51	·68
40·5	·57	1·13	1·63	57·2	1·44	1·88	2·63
75·4	·28	1·42	1·85	93·7	·35	1·39	2·32
9·4	—	·28	·47	8·8	·03	·08	·61
2·8	—	·28	·16	2·6	·16	·41	·19
24·9	—	·28	1·38	36·9	·03	·41	1·95
12·8	—	2·83	·46	8·4	·03	·95	·49
23·5	—	—	1·05	26·8	·03	·11	·92
64·0	—	·57	1·91	76·8	—	·14	2·46
—	—	—	—	·1	·11	·08	·01
—	·57	—	—	·4	·54	·08	·04
95·5	·57	1·70	2·80	98·5	·38	·95	3·46
—	—	—	—	—	—	—	—
2·8	—	—	·07	2·2	—	—	·04
—	—	—	—	—	·03	—	—
554·1	4·25	20·40	23·97	643·2	5·39	13·50	29·20

* These ratios are calculated on the strength including men detached.

ABSTRACT C.—Table showing the Average Strength, Admissions among the Troops stationed in Ireland during the Year 1896, with

Average Strength in Annual Returns, 23,617. Average Strength, including Men detached, 24,931.	Admissions into Hospital.	Died			Invalids Discharged the Service.	Average Number constantly Sick.
Diseases.		With the Regiment.	Absent from the Regiment.	Total.		
I.—GENERAL DISEASES.						
Group "A."						
Sub-Group I.						
Small-pox	—	—	—	—	—	—
Other Eruptive Fevers	111	2	—	2	—	8·24
Enteric Fever	47	12	—	12	—	8·25
Other Continued Fevers	101	—	—	—	—	3·44
Yellow Fever	—	—	—	—	—	—
Cholera	—	—	—	—	—	—
Dysentery	13	—	—	—	3	1·29
Other Diseases	158	—	—	—	—	9·17
Total	430	14	—	14	3	30·39
Sub-Group II.—Malarial Fevers	80	—	—	—	2	3·50
Sub-Group III.—Septic Diseases	22	—	—	—	—	1·42
Sub-Group IV.						
Syphilis, Primary	825	—	—	—	—	80·69
„ Secondary	605	—	—	—	17	59·75
Gonorrhœa	1,492	—	—	—	1	113·33
Total	2,922	—	—	—	18	253·82
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—
Group "B."						
Sub-Group I.—Parasitic Diseases	4	—	—	—	—	·12
Sub-Group II. Scurvy	—	—	—	—	—	—
Alcoholism	46	1	—	1	—	1·86
Group "C."						
Debility, &c.	204	—	—	—	23	13·11
Group "D."						
Rheumatism	602	2	—	2	20	37·54
Tubercular Diseases	71	12	3	15	51	11·40
Other Diseases	102	4	—	4	8	8·30
II.—LOCAL DISEASES.						
Diseases of the—						
1. Nervous System { Nervous Diseases	153	4	—	4	24	10·79
Mental „	23	1	—	1	25	4·93
2. Eye	273	—	—	—	23	16·46
3 & 4. Other Organs of Special Sense	205	1	—	1	37	15·49
5. Circulatory System	366	9	—	9	154	34·53
6. Respiratory „	874	13	1	14	13	41·96
7. Digestive „	2,101	10	—	10	41	71·13
8. Lymphatic and Glandular System	255	—	—	—	2	25·03
9. Urinary System	70	1	—	1	17	7·95
10. Generative „	616	—	—	—	7	42·83
11. Organs of Locomotion	288	—	—	—	58	21·28
12. Connective Tissue	660	1	—	1	2	29·82
13. Skin	1,870	—	—	—	6	74·85
III.—POISONS	1	—	—	—	—	·04
IV.—INJURIES.						
1. General	5	4	1	5	—	·31
2. Local	2,796	4	—	4	20	113·21
3. In Action	—	—	—	—	—	—
No appreciable disease	40	—	—	—	—	1·23
Cause unknown (refers to deaths only)	—	—	—	—	—	—
General Total	15,079	81	5	86	554	873·30

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.				Average Ratio per 1,000 from 1886 to 1895.			
Admissions.	Deaths.*	Invalids Discharged the Service.*	Constantly Sick.	Admissions.	Deaths.*	Invalids Discharged the Service.*	Constantly Sick.
—	—	—	—	—	—	—	·01
4·7	·08	—	·35	4·6	·05	—	·30
2·0	·48	—	·35	2·3	·49	—	·38
4·3	—	—	·15	6·6	·01	—	·24
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
·5	—	·12	·05	·3	·01	·03	·02
6·7	—	—	·39	13·6	·06	—	·37
18·2	·56	·12	1·29	27·4	·62	·03	1·32
3·4	—	·08	·15	2·9	·01	·01	·10
·9	—	—	·06	1·6	·03	·01	·11
34·9	—	—	3·42	53·1	—	—	4·89
25·6	—	·68	2·53	28·7	·06	·58	2·63
63·2	—	·04	4·80	84·3	—	·04	5·64
123·7	—	·72	10·75	166·1	·06	·62	13·16
—	—	—	—	—	—	—	—
·2	—	—	—	·4	—	—	·01
—	—	—	—	·1	—	—	·01
1·9	·04	—	·08	2·1	·02	·02	·06
8·6	—	·92	·56	7·0	·01	·90	·49
25·5	·08	·80	1·59	31·1	·03	·50	1·94
3·0	·60	2·05	·48	3·3	·88	1·55	·58
4·3	·16	·32	·35	4·9	·10	·28	·36
6·5	·16	·96	·46	6·6	·29	1·04	·44
1·0	·04	1·00	·21	1·7	·01	1·15	·30
11·6	—	·92	·70	12·1	—	·59	·75
8·7	·04	1·48	·66	6·7	—	·63	·42
15·5	·36	6·17	1·46	9·0	·34	2·63	·83
37·9	·56	·52	1·78	60·5	1·10	·72	3·10
89·0	·40	1·65	3·01	94·0	·27	·76	2·86
10·8	—	·08	1·06	15·2	—	·11	1·58
3·0	·04	·68	·34	2·2	·15	·26	·19
26·1	—	·28	1·81	33·9	·01	·22	1·99
12·2	—	2·33	·90	8·5	·03	·77	·63
27·9	·04	·08	1·26	23·0	—	·07	1·01
79·2	—	·24	3·17	70·7	—	·21	2·76
—	—	—	—	·1	·03	·01	—
·2	·20	—	·01	·1	·42	·01	·01
118·4	·16	·80	4·79	101·0	·35	·58	4·08
—	—	—	—	—	—	—	—
1·7	—	—	·05	2·3	—	—	·08
—	—	—	—	—	—	—	—
638·5	3·45	22·20	36·98	694·5	4·76	13·68	39·12

---

* These ratios are calculated on the strength including men detached.

ABSTRACT D.—TABLE showing the AVERAGE STRENGTH, SICKNESS, UNITED KINGDOM during the Year 1896,

Average Strength.	Officers, 4,031.			
Diseases.	Attacks of Illness.	Deaths.	Ratio per 1,000.	
			Attacks.	Deaths.
I.—GENERAL DISEASES.				
GROUP "A."				
Sub-Group I. Small-pox	—	—	—	—
Sub-Group I. Other Eruptive Fevers	18	—	4·5	—
Sub-Group I. Enteric Fever	10	1	2·5	·25
Sub-Group I. Other Continued Fevers	27	—	6·7	—
Sub-Group I. Yellow Fever	—	—	—	—
Sub-Group I. Cholera	—	—	—	—
Sub-Group I. Dysentery	7	1	1·7	·25
Sub-Group I. Other Diseases	74	1	18·3	·25
Total	136	3	33·7	·74
Sub-Group II.—Malarial Fevers	59	—	14·6	—
Sub-Group III.—Septic Diseases	4	—	1·0	—
Sub-Group IV. Syphilis, Primary	4	—	1·0	—
Sub-Group IV. „ Secondary	2	—	·5	—
Sub-Group IV. Gonorrhœa	9	—	2·2	—
Total	15	—	3·7	—
Sub-Group V.—Hydrophobia, &c.	—	—	—	—
GROUP "B."				
Sub-Group I.—Parasitic Diseases	2	—	·5	—
Sub-Group II. Scurvy	—	—	—	—
Sub-Group II. Alcoholism	—	—	—	—
GROUP "C."				
Debility, &c.	21	—	5·2	—
GROUP "D."				
Rheumatism	71	—	17·6	—
Tubercular Diseases	1	1	·3	·25
Other Diseases	3	3	·8	·74
II.—LOCAL DISEASES.				
Diseases of the—				
1. Nervous System, Nervous Diseases	31	—	7·7	—
1. Nervous System, Mental „	1	—	·3	—
2. Eye	18	—	4·5	—
3 & 4. Other Organs of Special Sense	7	—	1·7	—
5. Circulatory System	7	2	1·7	·50
6. Respiratory „	149	2	37·0	·50
7. Digestive „	231	3	57·3	·74
8. Lymphatic and Glandular System	7	—	1·7	—
9. Urinary System	23	2	5·7	·50
10. Generative „	17	—	4·2	—
11. Organs of Locomotion	53	—	13·1	—
12. Connective Tissue	36	—	8·9	—
13. Skin	38	—	9·4	—
III.—POISONS	1	—	·3	—
IV.—INJURIES.				
1. General	3	—	·8	—
2. Local	290	1	71·9	·25
3. In Action	—	—	—	—
No appreciable disease	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—
General Total	1,224	17	303·6	4·22

and MORTALITY among the OFFICERS, WOMEN, and CHILDREN in the
with the Ratios per 1,000 of the Strength.

Women, 11,208.				Children, 21,905.			
Attacks of Illness.	Deaths.	Ratio per 1,000.		Attacks of Illness.	Deaths.	Ratio per 1,000.	
		Attacks.	Deaths.			Attacks.	Deaths.
—	—	—	—	—	—	—	—
36	—	3·2	—	2,436	26	111·2	1·19
7	—	·6	—	18	3	·8	·14
23	—	2·1	—	161	—	7·4	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
8	—	·7	—	12	—	·5	—
82	—	7·3	—	767	29	35·0	1·32
156	—	13·9	—	3,394	58	154·9	2·65
55	1	4·9	·09	55	1	2·5	·05
24	4	2·1	·36	8	—	·4	—
—	—	—	—	—	—	—	—
5	2	·4	·18	19	2	·9	·09
—	—	—	—	—	—	—	—
5	2	·4	·18	19	2	·9	·09
—	—	—	—	—	—	—	—
4	—	·4	—	87	—	4·0	—
—	—	—	—	—	—	—	—
1	—	·1	—	—	—	—	—
725	1	64·7	·09	508	44	23·2	2·01
152	1	13·6	·09	57	1	2·6	·05
42	11	3·7	·98	39	15	1·8	·68
114	1	10·2	·09	89	4	4·1	·18
183	1	16·3	·09	189	58	8·6	2·65
5	—	·4	—	—	—	—	—
38	—	3·4	—	211	—	9·6	—
10	—	·9	—	87	1	4·0	·05
76	4	6·8	·36	11	1	·5	·05
433	5	38·6	·45	3,124	109	142·7	4·97
749	4	66·8	·36	1,926	52	87·9	2·37
14	—	1·3	—	101	—	4·6	—
21	1	1·9	·09	13	2	·6	·09
428	4	38·2	·36	29	—	1·3	—
28	—	2·5	—	27	1	1·2	·05
82	—	7·3	—	186	3	8·5	·13
87	—	7·8	—	718	—	32·8	—
—	1	—	·09	2	1	·1	·05
—	—	—	—	4	4	·2	·18
61	—	5·4	—	448	6	20·4	·27
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
3,493	41	311·6	3·66	11,332	363	517·4	16·57

ABSTRACT No. II.—Table showing the Average Strength, Admissions the Troops stationed at Gibraltar during the Year 1896, with the Ratios

Average Strength, 4,630.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
Diseases.		In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
I.—GENERAL DISEASES.							
Group "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	2	—	—	—	—	—	·13
Enteric Fever	8	2	—	2	—	—	1·40
Other Continued Fevers	52	—	—	—	1	—	3·78
Yellow Fever	—	—	—	—	—	—	—
Cholera	—	—	—	—	—	—	—
Dysentery	2	—	—	—	—	—	·34
Other Diseases	87	—	—	—	—	—	2·72
Total	151	2	—	2	1	—	8·37
Sub-Group II.—Malarial Fevers	67	—	—	—	—	—	3·21
Sub-Group III.—Septic Diseases	3	—	—	—	—	—	·20
Sub-Group IV. Syphilis, Primary	27	—	—	—	—	—	3·22
" Secondary	97	—	—	—	—	—	11·92
Gonorrhœa	655	—	—	—	—	—	65·64
Total	779	—	—	—	—	—	80·78
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
Group "B."							
Sub-Group I.—Parasitic Diseases	13	—	—	—	—	—	·24
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Alcoholism	30	—	—	—	—	—	1·51
Group "C."							
Debility, &c.	21	—	—	—	2	—	2·77
Group "D."							
Rheumatism	94	—	—	—	—	—	6·48
Tubercular Diseases	8	1	2	3	3	3	·85
Other Diseases	35	—	—	—	2	—	2·88
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System { Nervous Diseases	58	1	—	1	2	—	2·61
Mental "	13	1	—	1	2	2	3·62
2. Eye	38	—	—	—	2	2	4·19
3 & 4. Other Organs of Special Sense	47	—	—	—	1	2	3·26
5. Circulatory System	17	3	—	3	4	4	2·85
6. Respiratory "	102	2	—	2	5	5	7·26
7. Digestive "	433	1	—	1	2	—	13·80
8. Lymphatic and Glandular System	73	—	—	—	2	—	12·88
9. Urinary System	9	1	—	1	—	—	·51
10. Generative "	354	1	—	1	—	—	41·47
11. Organs of Locomotion	28	1	—	1	1	1	2·05
12. Connective Tissue	92	—	—	—	—	—	6·18
13. Skin	209	—	—	—	—	—	11·07
III.—POISONS	—	—	—	—	—	—	—
IV.—INJURIES.							
1. General	—	—	—	—	—	—	—
2. Local	544	3	—	3	1	—	27·26
3. In Action	—	—	—	—	—	—	—
No appreciable disease	21	—	—	—	—	—	·44
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	3,239	17	2	19	30	19	246·74

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
·4	—	—	—	·03	·6	—	—	—	·05
1·7	·43	—	—	·30	9·1	1·56	2·77	—	1·63
11·2	—	·22	—	·82	25.6	·05	2·65	·09	2·95
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
·4	—	—	—	·07	·4	·02	—	—	·03
18·5	—	—	—	·59	17·3	·02	—	—	·31
32·6	·43	·22	—	1·81	53·0	1·65	5·42	·09	4·97
14·5	—	—	—	·69	3·6	·02	·04	·04	·10
·6	—	—	—	·04	·7	·04	—	—	·03
5·8	—	—	—	·70	27·7	—	—	·02	2·77
21·0	—	—	—	2·57	27·2	·11	·71	·21	2·62
141·5	—	—	—	14·18	122·9	—	·02	—	8·72
168·3	—	—	—	17·45	177·8	·11	·73	·23	14·11
—	—	—	—	—	—	·02	—	—	—
2·8	—	—	—	·05	·7	—	—	—	·02
—	—	—	—	—	—	—	—	—	—
6·5	—	—	—	·33	5·1	·02	·02	—	·17
4·5	—	·43	—	·60	4·4	·02	1·30	·86	·31
29·3	—	—	—	1·40	29·3	—	1·05	·28	1·80
1·7	·65	·65	·65	·13	2·0	·45	1·54	1·15	·36
7·5	—	·43	—	·62	4·7	·15	·36	·21	·40
12·5	·22	·43	—	·56	7·2	·21	·94	·92	·46
2·8	·22	·43	·43	·78	·8	·02	·79	·75	·20
8·2	—	·43	·43	·90	11·0	—	·73	·66	·83
10·2	—	·22	·43	·70	8·7	—	·62	·53	·57
3·7	·65	·86	·86	·62	3·3	·34	·98	·94	·34
22·0	·43	1·08	1·08	1·57	28·1	·39	·77	·41	1·57
93·5	·22	·43	—	2·98	86·1	·23	·49	·26	2·41
15·8	—	·43	—	2·78	12·6	—	·11	·09	1·50
1·9	·22	—	—	·11	1·6	·13	·26	·17	·15
76·5	·22	—	—	8·96	104·3	·02	·04	·04	8·22
6·1	·22	·22	·22	·44	5·6	·04	·55	·43	·43
19·9	—	—	—	1·34	19·3	—	·06	·04	·95
45·1	—	—	—	2·39	46·4	—	·04	·04	1·85
—	—	—	—	—	—	·02	—	—	—
—	—	—	—	—	·2	·21	·02	·02	·03
117·5	·65	·22	—	5·89	102·4	·36	·41	·38	4·32
—	—	—	—	—	—	—	—	—	—
4·5	—	—	—	·10	3·2	—	—	—	·10
—	—	—	—	—	—	—	—	—	—
699·5	4·10	6·48	4·10	53·29	722·1	4·50	17·27	8·54	46·20

ABSTRACT No. III.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the TROOPS stationed at MALTA during the Year 1896, with the Ratios

Average Strength, 8,316. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Sub-Group I. Other Eruptive Fevers	6	1	—	1	—	—	·42
Sub-Group I. Enteric Fever	49	20	—	20	6	1	8·36
Sub-Group I. Other Continued Fevers	1,572	15	—	15	69	2	110·18
Sub-Group I. Yellow Fever	—	—	—	—	—	—	—
Sub-Group I. Cholera	—	—	—	—	—	—	—
Sub-Group I. Dysentery	44	—	—	—	—	—	3·42
Sub-Group I. Other Diseases	1	—	—	—	—	—	·09
Total	1,672	36	—	36	75	3	122·47
Sub-Group II.—Malarial Fevers	179	—	—	—	4	—	6·54
Sub-Group III.—Septic Diseases	2	—	—	—	—	1	·18
Sub-Group IV. Syphilis, Primary	394	—	—	—	—	—	37·54
Sub-Group IV. „ Secondary	135	1	1	2	10	6	15·70
Sub-Group IV. Gonorrhœa	810	—	—	—	2	—	61·45
Total	1,339	1	1	2	12	6	114·69
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	5	—	—	—	—	—	·09
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Sub-Group II. Alcoholism	10	—	—	—	—	—	·33
GROUP "C."							
Debility, &c.	38	—	—	—	5	2	3·40
GROUP "D."							
Rheumatism	200	—	—	—	6	2	13·63
Tubercular Diseases	8	4	1	5	9	9	2·92
Other Diseases	91	1	—	1	3	—	7·97
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System, Nervous Diseases	28	2	—	2	4	3	1·80
1. Nervous System, Mental „	10	—	—	—	11	11	3·87
2. Eye	98	—	—	—	3	1	5·69
3 & 4. Other Organs of Special Sense	88	—	—	—	5	4	6·07
5. Circulatory System	27	1	—	1	11	13	4·36
6. Respiratory „	101	4	1	5	10	5	10·25
7. Digestive „	593	3	—	3	4	1	21·47
8. Lymphatic and Glandular System	93	—	—	—	—	—	12·21
9. Urinary System	15	2	—	2	1	—	·96
10. Generative „	225	—	—	—	3	2	17·23
11. Organs of Locomotion	53	—	1	1	4	2	3·92
12. Connective Tissue	280	—	—	—	1	—	12·20
13. Skin	647	—	—	—	2	1	25·10
III.—POISONS	8	—	—	—	—	—	·23
IV.—INJURIES.							
1. General	5	4	—	4	—	—	·40
2. Local	745	4	—	4	5	2	33·62
3. In Action	—	—	—	—	—	—	—
No appreciable disease	42	—	—	—	—	—	1·92
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	6,602	62	4	66	178	68	433·52

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
·7	·12	—	—	·05	·3	—	—	—	·02
5·9	2·41	·72	·12	1·01	6·3	2·17	·74	·02	1·20
189·0	1·80	8·30	·24	13·25	119·9	1·10	4·37	·36	9·53
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	·02	—	—	—
5·3	—	—	—	·41	4·4	·23	·13	·04	·36
·1	—	—	—	·01	5·3	·04	·02	—	·17
201·0	4·33	9·02	·36	14·73	136·2	3·56	5·26	·42	11·28
21·5	—	·48	--	·79	11·1	·17	·29	·04	·61
·2	—	—	·12	·02	·7	·07	—	—	·07
47·4	—	—	—	4·51	18·0	—	—	—	1·99
16·2	·24	1·20	·72	1·89	15·3	·03	·44	·23	1·70
97·4	—	·24	—	7·39	67·7	—	·07	·03	4·93
161·0	·24	1·44	·72	13.79	101·0	·03	·51	·26	8·62
—	—	—	—	—	—	—	—	—	—
·6	—	—	—	·01	1·3	—	—	·01	·03
—	—	—	—	—	—	—	—	—	·01
1·2	—	—	—	·04	2·9	·02	·01	—	·11
4·6	—	·60	·24	·41	10·2	—	·97	·84	·99
24·1	—	·72	·24	1·64	24·8	·09	·85	·42	1·88
1·0	·60	1·08	1·08	·35	2·7	·83	1·58	1·32	·45
10·9	·12	·36	—	·96	4·2	·09	·14	·17	·27
3·4	·24	·48	·86	·22	6·1	·16	·75	·83	·41
1·2	—	1·32	1·32	·47	1·7	·04	1·48	1·59	·38
11·8	—	·36	·12	·68	10·3	—	·51	·36	·64
10·6	—	·60	·48	·73	11·1	—	·71	·67	·70
3·2	·12	1·32	1·56	·52	7·0	·20	1·72	1·56	·73
12·1	·60	1·20	·60	1·23	22·4	·54	1·19	·52	1·73
71·3	·36	·48	·12	2·58	80·9	·58	·59	·28	2·84
11·2	—	—	—	1·47	7·5	—	·10	·07	·83
1·8	·24	·12	—	·12	1·9	·03	·55	·35	·20
27·1	—	·36	·24	2·07	39·4	·01	·82	·29	2·74
6·4	·12	·48	·24	·47	5·9	·03	·39	·41	·48
83·7	—	·12	—	1·47	27·9	·01	·06	·01	1·15
77·8	—	·24	·12	3·01	47·4	—	·16	·06	2·22
1·0	—	—	—	·03	·2	·04	—	—	·01
·6	·48	—	—	·05	·6	·58	·04	·03	·06
59·6	·48	·60	·24	4·04	87·8	·32	·55	·43	3·97
—	—	—	—	—	—	—	—	—	—
5·0	—	—	—	·23	2·4	—	—	—	·11
—	—	--	—	—	—	—	—	—	—
798·9	7·93	21·40	8·18	52·18	655·6	7·45	18·73	10·94	43·52

ABSTRACT No. IIIa.—Table showing the Average Strength, Admissions the Royal Malta Artillery stationed at Malta during the Year 1896,

Average Strength, 499.		Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
Diseases.			In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
I.—GENERAL DISEASES.								
Group "A."								
Sub-Group I.	Small-pox	—	—	—	—	—	—	—
	Other Eruptive Fevers	—	—	—	—	—	—	—
	Enteric Fever	1	1	—	1	—	—	·02
	Other Continued Fevers	23	—	—	—	—	—	·95
	Yellow Fever	—	—	—	—	—	—	—
	Cholera	—	—	—	—	—	—	—
	Dysentery	—	—	—	—	—	—	—
	Other Diseases	—	—	—	—	—	—	—
	Total	24	1	—	1	—	—	·97
Sub-Group II.—Malarial Fevers		—	—	—	—	—	—	—
Sub-Group III.—Septic Diseases		—	—	—	—	—	—	—
Sub-Group IV.	Syphilis, Primary	7	—	—	—	—	—	·43
	„ Secondary	1	—	—	—	—	—	·07
	Gonorrhœa	8	—	—	—	—	—	·51
	Total	16	—	—	—	—	—	1·01
Sub-Group V.—Hydrophobia, &c.		—	—	—	—	—	—	—
Group "B."								
Sub-Group I.—Parasitic Diseases		1	—	—	—	—	—	·01
Sub-Group II.	Scurvy	—	—	—	—	—	—	—
	Alcoholism	—	—	—	—	—	—	—
Group "C."								
Debility, &c.		6	—	—	—	—	—	·39
Group "D."								
Rheumatism		10	—	—	—	—	—	·59
Tubercular Diseases		1	1	—	1	—	—	·01
Other Diseases		—	—	—	—	—	—	—
II.—LOCAL DISEASES.								
Diseases of the—								
1. Nervous System	Nervous Diseases	2	—	—	—	—	—	·21
	Mental „	1	—	—	—	—	—	·03
2. Eye		6	—	—	—	—	1	·26
3 & 4. Other Organs of Special Sense		9	—	—	—	—	—	·38
5. Circulatory System		1	1	—	1	—	—	·06
6. Respiratory „		19	—	—	—	—	—	·61
7. Digestive „		24	—	—	—	—	1	·50
8. Lymphatic and Glandular System		—	—	—	—	—	—	—
9. Urinary System		1	—	—	—	—	—	·01
10. Generative „		4	—	—	—	—	—	·17
11. Organs of Locomotion		2	—	—	—	—	1	·16
12. Connective Tissue		7	—	—	—	—	—	·56
13. Skin		18	—	—	—	—	1	·76
III.—POISONS		—	—	—	—	—	—	—
IV.—INJURIES.								
1. General		—	—	—	—	—	—	—
2. Local		52	—	—	—	—	—	2·11
3. In Action		—	—	—	—	—	—	—
No appreciable disease		3	—	—	—	—	—	·08
Cause unknown (refers to deaths only)		—	—	—	—	—	—	—
General Total		207	3	—	3	—	4	8·88

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among with the Ratios per 1,000 of the Strength, and the average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	1·6	—	—	—	·05
2·0	2·04	—	—	·04	·3	·27	—	—	—
47·0	—	—	—	1·94	61·3	—	—	—	2·47
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·3	·27	—	—	—
—	—	—	—	—	·3	—	—	—	·01
—	—	—	—	—	12·0	—	—	—	·28
49·1	2·04	—	—	1·98	75·8	·55	—	—	2·81
—	—	—	—	—	1·1	—	—	—	·02
—	—	—	—	—	·8	—	—	—	·08
14·3	—	—	—	·88	11·4	—	—	—	·56
2·0	—	—	—	·14	7·4	—	—	·27	·64
16·4	—	—	—	1·04	30·8	—	—	·27	2·50
32·7	—	—	—	2·07	49·6	—	—	·55	4·00
—	—	—	—	—	—	—	—	—	—
2·0	—	—	—	·02	·6	—	—	—	·01
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
12·3	—	—	—	·80	17·7	—	—	3·27	·97
20·5	—	—	—	1·21	27·0	—	—	·27	1·00
2·0	2·04	—	—	·02	3·0	·27	—	1·36	·45
—	—	—	—	—	4·1	—	—	·27	·28
4·1	—	—	—	·43	4·9	·27	—	·27	·12
2·0	—	—	—	·06	1·1	—	—	1·09	·14
12·3	—	—	2·04	·53	22·6	—	—	·55	·98
18·4	—	—	—	·78	6·3	—	—	·55	·18
2·0	2·04	—	—	·12	4·1	·27	—	1·09	·34
38·9	—	—	—	1·25	66·0	·27	—	·55	2·78
49·1	—	—	2·04	1·02	81·8	—	—	1·09	1·61
—	—	—	—	—	2·5	—	—	—	·09
2·0	—	—	—	·02	1·6	—	—	·27	·10
8·2	—	—	—	·35	6·5	—	—	—	·19
4·1	—	—	2·04	·33	5·5	—	—	2·45	·30
14·3	—	—	—	1·14	13·6	—	—	—	·42
36·8	—	—	2·04	1·55	67·1	—	—	—	2·30
—	—	—	—	—	—	·27	—	—	—
—	—	—	—	—	—	—	—	—	—
106·4	—	—	—	4·32	123·8	·55	—	·55	3·50
—	—	—	—	—	—	—	—	—	—
6·1	—	—	—	·16	·3	—	—	—	·02
—	—	—	—	—	—	—	—	—	—
423·3	6·13	—	8·18	18·16	587·4	2·45	—	14·18	22·64

ABSTRACT No. IV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the TROOPS stationed in CANADA during the Year 1896, with the

Average Strength, 1,504.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
Diseases.		In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	1	—	—	—	—	—	·09
Enteric Fever	—	—	—	—	—	—	—
Other Continued Fevers	—	—	—	—	—	—	—
Yellow Fever	—	—	—	—	—	—	—
Cholera	—	—	—	—	—	—	—
Dysentery	1	—	—	—	—	—	·09
Other Diseases	37	—	—	—	—	—	·89
Total	39	—	—	—	—	—	1·07
Sub-Group II.—Malarial Fevers	2	—	—	—	—	—	·04
Sub-Group III.—Septic Diseases	1	—	—	—	—	—	·08
Sub-Group IV. Syphilis, Primary	52	—	—	—	—	—	3·74
" Secondary	20	—	—	—	2	—	2·01
Gonorrhœa	100	—	—	—	—	—	3·68
Total	172	—	—	—	2	—	9·43
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	1	—	—	—	—	—	·02
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Alcoholism	3	—	—	—	—	—	·07
GROUP "C."							
Debility, &c.	6	—	—	—	2	2	·23
GROUP "D."							
Rheumatism	71	—	—	—	1	1	4·40
Tubercular Diseases	1	—	1	1	1	—	·05
Other Diseases	11	—	—	—	1	—	·43
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System, Nervous Diseases	3	1	—	1	—	—	·15
Mental "	1	—	—	—	1	1	·14
2. Eye	20	—	—	—	1	1	·76
3 & 4. Other Organs of Special Sense	11	1	—	1	—	—	·45
5. Circulatory System	8	1	—	1	4	4	·79
6. Respiratory "	47	1	—	1	2	—	3·10
7. Digestive "	112	—	—	—	—	—	2·45
8. Lymphatic and Glandular System	44	—	—	—	—	—	4·67
9. Urinary System	4	—	—	—	1	1	·21
10. Generative "	55	—	—	—	—	—	2·75
11. Organs of Locomotion	25	—	—	—	6	2	2·21
12. Connective Tissue	29	—	—	—	—	—	1·06
13. Skin	77	—	—	—	—	—	2·97
III.—POISONS	—	—	—	—	—	—	—
IV.—INJURIES.							
1. General	1	—	—	—	—	—	·16
2. Local	109	—	—	—	2	2	4·78
3. In Action	—	—	—	—	—	—	—
No appreciable disease	3	—	—	—	—	—	·19
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	856	4	1	5	24	14	42·66

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
·7	—	—	—	·06	1·9	·07	—	—	·12
—	—	—	—	—	1·4	·22	·07	—	·26
—	—	—	—	—	2·5	—	—	—	·11
—	—	—	—	—	·1	—	—	—	·01
—	—	—	—	—	—	—	—	—	—
·7	—	—	—	·06	·1	—	—	—	—
24·6	—	—	—	·59	6·8	—	—	—	·23
25·9	—	—	—	·71	12·8	·29	·07	—	·73
1·3	—	—	—	·08	1·2	—	—	—	·05
·7	—	—	—	·05	2·6	·07	—	—	·16
34·6	—	—	—	2·49	27·4	—	—	—	1·94
13·3	—	1·33	—	1·33	19·8	—	·51	·44	1·69
66·5	—	—	—	2·45	61·1	—	—	—	2·95
114·4	—	1·33	—	6·27	108·3	—	·51	·44	6·58
—	—	—	—	—	—	—	—	—	—
·7	—	—	—	·01	·3	—	—	—	·01
—	—	—	—	—	—	—	—	—	—
2·0	—	—	—	·05	3·0	—	—	—	·09
4·0	—	1·33	1·33	·15	2·5	—	1·02	·51	·17
47·2	—	·66	·66	2·92	28·6	—	·73	·07	1·79
·7	·66	·66	—	·03	2·0	·87	1·39	1·31	·25
7·3	—	·66	—	·29	4·4	—	·36	·51	·24
2·0	·66	—	—	·10	10·1	·44	2·11	1·97	·70
·7	—	·66	·66	·09	·8	·07	·73	·73	·15
13·3	—	·66	·66	·51	8·5	—	·73	·80	·38
7·3	·66	—	—	·30	6·3	—	·58	·58	·43
5·3	·66	2·66	2·66	·53	9·4	·44	2·11	2·26	·84
31·2	·66	1·33	—	2·06	36·3	·73	1·17	1·16	2·04
74·5	—	—	—	1·63	75·7	·22	·22	·15	1·91
29·2	—	—	—	3·10	15·7	—	·07	—	1·47
2·6	—	·66	·66	·14	2·5	·15	·73	·36	·29
36·5	—	—	—	1·83	25·5	—	·22	·15	1·16
16·6	—	3·99	1·33	1·47	8·7	—	·87	·80	·72
19·3	—	—	—	·70	21·6	—	·15	—	·89
51·2	—	—	—	1·97	34·3	—	·07	·22	1·28
—	—	—	—	—	·3	·22	—	—	—
·7	—	—	—	·11	·2	·51	—	—	·01
72·5	—	1·33	1·33	3·18	76·5	·29	·66	·51	3·25
—	—	—	—	—	—	—	—	—	—
2·0	—	—	—	·13	1·4	—	—	—	·07
—	—	—	—	—	—	—	—	—	—
569·1	3·32	15·96	9·31	28·33	499·5	4·30	14·50	12·53	25·66

ABSTRACT No. V.—Table showing the Average Strength, Admissions the Troops stationed at Bermuda during the Year 1896, with the Ratios

Average Strength, 1,387.		Deaths.			Invalids.		
Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	Average Number constantly Sick.
I.—GENERAL DISEASES.							
Group "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Sub-Group I. Other Eruptive Fevers	—	—	—	—	—	—	—
Sub-Group I. Enteric Fever	27	4	—	4	—	—	7·65
Sub-Group I. Other Continued Fevers	21	—	—	—	—	—	1·02
Sub-Group I. Yellow Fever	—	—	—	—	—	—	—
Sub-Group I. Cholera	—	—	—	—	—	—	—
Sub-Group I. Dysentery	4	—	—	—	—	—	·18
Sub-Group I. Other Diseases	—	—	—	—	—	—	—
Total	52	4	—	4	—	—	8·85
Sub-Group II.—Malarial Fevers	7	—	—	—	—	—	·32
Sub-Group III.—Septic Diseases	—	—	—	—	—	—	—
Sub-Group IV. Syphilis, Primary	3	—	—	—	—	—	·15
Sub-Group IV. „ Secondary	17	—	—	—	2	—	2·41
Sub-Group IV. Gonorrhœa	27	—	—	—	—	—	1·54
Total	47	—	—	—	2	—	4·10
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
Group "B."							
Sub-Group I.—Parasitic Diseases	1	—	—	—	—	—	·01
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Sub-Group II. Alcoholism	30	—	—	—	—	—	1·06
Group "C."							
Debility, &c.	8	—	—	—	2	—	·51
Group "D."							
Rheumatism	20	—	—	—	—	—	·80
Tubercular Diseases	7	2	—	2	3	1	1·01
Other Diseases	6	—	—	—	—	—	·39
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System Nervous Diseases	5	—	—	—	1	—	·96
1. Nervous System Mental „	3	—	—	—	4	—	2·19
2. Eye	26	—	—	—	—	—	·72
3 & 4. Other Organs of Special Sense	17	—	—	—	—	—	·94
5. Circulatory System	2	—	—	—	—	—	·03
6. Respiratory „	25	1	—	1	2	—	1·46
7. Digestive „	99	—	—	—	6	—	3·13
8. Lymphatic and Glandular System	3	—	—	—	—	—	·09
9. Urinary System	6	—	—	—	2	—	·73
10. Generative „	12	—	—	—	—	—	·40
11. Organs of Locomotion	15	—	—	—	—	—	·90
12. Connective Tissue	51	—	—	—	—	—	1·61
13. Skin	53	—	—	—	—	—	1·28
III.—POISONS	—	—	—	—	—	—	—
IV.—INJURIES.							
1. General	—	1	—	1	—	—	—
2. Local	156	—	—	—	—	—	5·71
3. In Action	—	—	—	—	—	—	—
No appreciable disease	2	—	—	—	—	—	·15
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	653	8	—	8	19	1	37·26

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1836 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
19·5	2·88	—	—	5·51	37·3	6·58	—	—	5·06
15·1	—	—	—	·74	25·5	—	—	—	1·20
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2·9	—	—	—	·13	1·5	·22	·07	·07	·10
—	—	—	—	—	4·5	—	—	—	·09
37·5	2·88	—	—	6·38	68·8	6·60	·07	·07	6·45
5·0	—	—	—	·23	1·5	—	—	—	·06
—	—	—	—	—	·1	—	—	—	—
2·2	—	—	—	·11	14·5	—	—	—	1·26
12·3	—	1·44	—	1·74	17·5	—	·80	·51	1·57
19·5	—	—	—	1·11	21·0	—	—	—	1·45
33·9	—	1·44	—	2·96	53·0	—	·80	·51	4·28
—	—	—	—	—	—	—	—	—	—
·7	—	—	—	·01	1·2	—	—	—	·03
—	—	—	—	—	—	—	—	—	—
21·6	—	—	—	·76	7·5	·07	—	—	·23
5·8	—	1·44	—	·37	10·6	—	1·16	·58	·63
14·4	—	—	—	·58	19·4	—	·51	·36	1·02
5·0	1·44	2·16	·72	·73	1·7	·58	1·09	·94	·26
4·3	—	—	—	·22	4·6	—	·15	—	·32
3·6	—	·72	—	·69	7·2	·65	·72	·36	·41
2·2	—	2·88	—	1·58	1·5	—	1·01	·94	·27
18·8	—	—	—	·52	11·9	—	·58	·51	·59
12·3	—	—	—	·68	9·3	—	·43	·65	·40
1·4	—	—	—	·02	8·5	·51	1·81	1·66	·79
18·0	·72	1·44	—	1·05	25·8	·65	1·37	1·01	1·51
71·4	—	2·16	—	2·25	107·9	·36	1·01	·58	2·99
2·2	—	—	—	·06	11·6	—	·07	·14	1·16
4·3	—	1·44	—	·53	2·0	·15	·07	—	·11
8·7	—	—	—	·29	16·8	—	·15	·07	·86
10·8	—	—	—	·65	8·8	·07	1·01	·80	·73
36·8	—	—	—	1·16	29·7	—	·07	—	1·03
38·2	—	—	—	·92	55·7	—	·07	—	1·89
—	—	—	—	—	·2	·07	—	—	·02
—	·72	—	—	—	·8	·36	—	—	·07
112·5	—	—	—	4·11	105·8	·43	·72	·43	4·09
—	—	—	—	—	—	—	—	—	—
1·4	—	—	—	·11	3·0	—	—	—	·08
—	—	—	—	—	—	—	—	—	—
470·8	5·77	13·70	·72	26·83	574·9	10·70	12·87	9·61	30·28

ABSTRACT No. VI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the EUROPEAN TROOPS stationed in the WEST INDIES during the Year 1896,

Average Strength, 1,293. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Sub-Group I. Other Eruptive Fevers	9	—	—	—	—	—	·25
Sub-Group I. Enteric Fever	4	—	—	—	1	—	1·07
Sub-Group I. Other Continued Fevers	90	—	—	—	—	—	4·00
Sub-Group I. Yellow Fever	—	—	—	—	—	—	—
Sub-Group I. Cholera	—	—	—	—	—	—	—
Sub-Group I. Dysentery	3	—	—	—	1	—	·37
Sub-Group I. Other Diseases	1	1	—	1	—	—	·01
Total	107	1	—	1	2	—	5·70
Sub-Group II.—Malarial Fevers	116	—	—	—	3	—	4·42
Sub-Group III.—Septic Diseases	—	—	—	—	—	—	—
Sub-Group IV. Syphilis, Primary	102	—	—	—	—	—	10·39
Sub-Group IV. „ Secondary	99	—	—	—	1	1	9·86
Sub-Group IV. Gonorrhœa	206	—	—	—	—	—	15·89
Total	407	—	—	—	1	1	36·14
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	1	—	—	—	—	—	·08
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Sub-Group II. Alcoholism	16	—	—	—	—	—	·36
GROUP "C."							
Debility, &c.	21	—	—	—	1	—	1·03
GROUP "D."							
Rheumatism	63	—	—	—	3	1	3·50
Tubercular Diseases	7	2	—	2	1	1	1·72
Other Diseases	14	—	—	—	1	—	·88
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System Nervous Diseases	11	—	—	—	2	1	·99
1. Nervous System Mental „	—	—	—	—	—	—	—
2. Eye	14	—	—	—	2	2	·89
3 & 4. Other Organs of Special Sense	31	—	—	—	3	2	1·71
5. Circulatory System	15	—	—	—	3	3	1·55
6. Respiratory „	26	—	—	—	1	1	1·34
7. Digestive „	131	2	—	2	—	—	4·41
8. Lymphatic and Glandular System	81	—	—	—	2	—	10·38
9. Urinary System	4	—	—	—	—	1	·58
10. Generative „	153	—	—	—	—	—	11·57
11. Organs of Locomotion	21	—	—	—	1	1	2·11
12. Connective Tissue	37	—	—	—	—	—	1·47
13. Skin	88	—	—	—	—	—	3·91
III.—POISONS	—	—	—	—	—	—	—
IV.—INJURIES.							
1. General	1	1	—	1	—	—	·02
2. Local	171	2	—	2	—	—	6·59
3. In Action	—	—	—	—	—	—	—
No appreciable disease	3	—	—	—	—	—	·07
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	1,539	8	—	8	26	14	101·37

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
7·0	—	—	—	·19	4·2	—	—	—	·13
3·1	—	·77	—	·83	9·9	2·76	·09	—	1·37
69·6	—	—	—	3·09	101·6	·17	—	—	3·28
—	—	—	—	—	2·0	1·04	—	—	·09
—	—	—	—	—	—	—	—	—	—
2·3	—	·77	—	·29	6·8	·43	·26	—	·41
·8	·77	—	—	·01	21·1	—	—	—	·53
82·8	·77	1·55	—	4·41	145·6	4·40	·35	—	5·81
89·7	—	2·32	—	3·42	47·2	·95	·52	·09	2·01
—	—	—	—	—	·5	—	—	—	·03
78·9	—	—	—	8·03	42·7	—	—	—	3·67
76·6	—	·77	·77	7·63	39·1	·17	1·98	·78	4·02
159·3	—	—	—	12·29	151·0	—	·17	—	10·76
314·8	—	·77	·77	27·95	232·8	·17	2·15	·78	18·45
—	—	—	—	—	—	—	—	—	—
·8	—	—	—	·02	1·4	—	—	—	·04
—	—	—	—	—	—	—	—	—	—
12·4	—	—	—	·28	7·7	·09	—	—	·19
16·2	—	·77	—	·80	15·1	—	2·16	1·03	·98
48·8	—	2·32	·77	2·71	37·3	·09	1·12	·60	2·22
5·4	1·55	·77	·77	1·33	1·7	·17	1·38	1·12	·35
10·8	—	·77	—	·68	8·8	·09	·52	·35	·67
8·5	—	1·55	·77	·77	13·5	·43	1·98	1·64	1·00
—	—	—	—	—	·7	—	·60	·78	·13
10·8	—	1·55	1·55	·69	12·4	—	·95	1·03	·76
24·0	—	2·32	1·55	1·32	22·5	—	1·12	·86	1·03
11·6	—	2·32	2·32	1·20	9·7	·43	1·98	1·90	·85
20·1	—	·77	·77	1·04	28·7	·60	·43	·60	1·44
101·3	1·55	—	—	3·41	99·6	·26	1·47	1·03	3·02
62·6	—	1·55	—	8·03	43·7	—	·43	·26	4·91
3·1	—	—	·77	·45	1·7	·26	·09	·09	·11
118·3	—	—	—	6·95	113·7	—	·17	·17	7·84
16·2	—	·77	·77	1·63	8·4	·09	1·04	·60	·67
28·6	—	—	—	1·14	39·9	—	—	·09	1·56
68·1	—	—	—	3·02	79·6	—	·35	·09	3·06
—	—	—	—	—	·7	·17	—	—	·01
·8	·77	—	—	·01	·2	·23	—	—	·05
132·2	1·55	—	—	5·09	138·5	·69	·86	·43	4·83
—	—	—	—	—	—	—	—	—	—
2·3	—	—	—	·05	4·1	—	—	—	·09
—	—	—	—	—	—	·09	—	—	—
1190·2	6·19	20·11	10·83	78·40	1115·7	9·23	19·67	13·54	62·11

ABSTRACT No. VII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the NON-EUROPEAN TROOPS stationed in the WEST INDIES during the Year 1896,

Average Strength, 1,525.		Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.		In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I.—GENERAL DISEASES.							
	GROUP "A."							
Sub-Group I.	Small-pox	—	—	—	—	—	—	—
	Other Eruptive Fevers	20	—	—	—	—	—	1·06
	Enteric Fever	—	—	—	—	—	—	·17
	Other Continued Fevers	37	—	—	—	—	—	1·02
	Yellow Fever	—	—	—	—	—	—	—
	Cholera	—	—	—	—	—	—	—
	Dysentery	45	—	—	—	—	—	2·70
	Other Diseases	6	—	—	—	—	—	·23
	Total	108	—	—	—	—	—	5·18
Sub-Group II.—Malarial Fevers		201	1	—	1	—	—	8·69
Sub-Group III.—Septic Diseases		—	—	—	—	—	—	—
Sub-Group IV.	Syphilis, Primary	170	—	—	—	—	—	18·58
	„ Secondary	93	1	—	1	—	14	11·35
	Gonorrhœa	210	—	—	—	—	—	17·29
	Total	473	1	—	1	—	14	47·22
Sub-Group V.—Hydrophobia, &c.		—	—	—	—	—	—	—
	GROUP "B."							
Sub-Group I.—Parasitic Diseases		—	—	—	—	—	—	—
Sub-Group II.	Scurvy	—	—	—	—	—	—	—
	Alcoholism	1	—	—	—	—	—	·02
	GROUP "C."							
Debility, &c.		3	—	—	—	—	—	·19
	GROUP "D."							
Rheumatism		54	—	—	—	—	1	4·13
Tubercular Diseases		20	5	—	5	—	16	2·89
Other Diseases		5	—	—	—	—	3	·82
	II.—LOCAL DISEASES.							
Diseases of the—								
1. Nervous System	Nervous Diseases	19	—	—	—	—	7	1·56
	Mental „	3	—	—	—	—	3	·66
2. Eye		43	—	—	—	—	5	3·39
3 & 4. Other Organs of Special Sense		18	—	—	—	—	—	·69
5. Circulatory System		29	3	—	3	—	9	3·07
6. Respiratory „		87	6	—	6	—	2	6·03
7. Digestive „		81	—	—	—	—	1	3·47
8. Lymphatic and Glandular System		33	—	—	—	—	—	3·65
9. Urinary System		4	—	—	—	—	—	·26
10. Generative „		107	—	—	—	—	—	9·22
11. Organs of Locomotion		4	1	—	1	—	1	·60
12. Connective Tissue		25	—	—	—	—	—	1·46
13. Skin		77	—	—	—	—	—	4·57
	III.—POISONS	1	—	—	—	—	—	·03
	IV.—INJURIES.							
1. General		—	1	—	1	—	—	—
2. Local		115	—	—	—	—	2	4·59
3. In Action		—	—	—	—	—	—	—
No appreciable disease		9	—	—	—	—	—	·27
Cause unknown (refers to deaths only)		—	—	—	—	—	—	—
	General Total	1,520	18	—	18	—	64	112·66

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	·1	—	—	—	·01
13·1	—	—	—	·70	12·8	—	—	—	·63
—	—	—	—	·11	3·0	1·41	—	—	·27
24·3	—	—	—	·67	100·6	·31	—	—	3·33
—	—	—	—	—	·1	·08	—	—	—
—	—	—	—	—	—	—	—	—	—
29·5	—	—	—	1·77	12·6	·31	—	·24	·71
3·9	—	—	—	·15	16·3	—	—	—	·49
70·8	—	—	—	3·40	145·5	2·11	—	·24	5·45
131·8	·66	—	—	5·70	99·1	1·88	—	·55	3·28
—	—	—	—	—	·3	—	—	—	·02
111·5	—	—	—	12·18	100·6	—	—	—	9·25
61·0	·66	—	9·18	7·44	45·6	·08	—	6·03	4·48
137·7	—	—	—	11·34	164·2	—	—	·08	10·43
310·2	·66	—	9·18	30·96	310·4	·08	—	6·11	24·16
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·5	—	—	—	·01
—	—	—	—	—	·1	—	—	—	—
·7	—	—	—	·01	·1	—	—	—	·01
2·0	—	—	—	·12	7·0	—	—	2·74	·61
35·4	—	—	·66	2·71	60·5	—	—	2·27	3·51
13·1	3·28	—	10·49	1·90	9·1	3·05	—	5·48	1·33
3·3	—	—	1·97	·54	6·1	·23	—	3·05	·84
12·4	—	—	4·59	1·02	9·9	·23	—	2·27	·66
2·0	—	—	1·97	·43	1·1	—	—	1·25	·29
23·2	—	—	3·28	2·22	25·7	—	—	2·04	1·80
11·8	—	—	—	·45	5·8	·03	—	·71	·43
19·0	1·97	—	5·90	2·01	12·8	1·02	—	3·99	1·31
57·0	3·93	—	1·31	3·95	50·6	2·04	—	1·41	3·38
53·1	—	—	·66	2·28	69·0	·71	—	1·72	2·14
21·6	—	—	—	2·39	44·9	·08	—	1·10	4·02
2·6	—	—	—	·17	2·9	·39	—	·86	·28
79·2	—	—	—	6·05	119·7	—	—	1·80	9·00
2·6	·66	—	·66	·39	8·6	—	—	2·12	·67
16·4	—	—	—	·96	33·4	—	—	·16	2·03
50·5	—	—	—	3·00	82·5	—	—	·78	3·86
·7	—	—	—	·02	·2	—	—	—	·01
—	·66	—	—	—	·5	·55	—	—	·01
75·4	—	—	1·31	3·01	79·3	·16	—	1·10	3·47
—	—	—	—	—	—	—	—	—	—
5·9	—	—	—	·18	6·4	—	—	—	·14
—	—	—	—	—	—	—	—	—	—
996·7	11·80	—	41·97	73·87	1192·0	12·61	—	41·75	72·72

ABSTRACT No. VIII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS
the NON-EUROPEAN TROOPS stationed at WEST AFRICA during the Year 1896,

Average Strength, 969.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
Diseases.		In the Command.	Of Invalids.	Total.	Number sent to West Indies.	Number finally Discharged the Service.	
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Enteric Fever	—	—	—	—	—	—	—
Other Continued Fevers	—	—	—	—	—	—	—
Yellow Fever	—	—	—	—	—	—	—
Cholera	—	—	—	—	—	—	—
Dysentery	6	—	—	—	—	—	·65
Other Diseases	—	—	—	—	—	—	—
Total	6	—	—	—	—	—	·65
Sub-Group II.—Malarial Fevers	1,286	5	—	5	1	—	32·63
Sub-Group III.—Septic Diseases	—	—	—	—	—	—	—
Sub-Group IV. Syphilis, Primary	74	—	—	—	—	—	6·37
„ Secondary	50	—	—	—	2	6	5·47
Gonorrhœa	92	—	—	—	—	—	6·07
Total	216	—	—	—	2	6	17·91
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	—	—	—	—	—	—	—
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Alcoholism	—	—	—	—	—	—	—
GROUP "C."							
Debility, &c.	11	—	—	—	—	—	·91
GROUP "D."							
Rheumatism	59	—	—	—	—	2	6·02
Tubercular Diseases	15	5	—	5	—	4	4·85
Other Diseases	5	—	—	—	1	2	·52
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System Nervous Diseases	4	1	—	1	—	1	·83
Mental „	2	—	—	—	1	1	·27
2. Eye	11	—	—	—	—	—	·92
3 & 4. Other Organs of Special Sense	3	—	—	—	—	—	·39
5. Circulatory System	20	1	—	1	2	2	3·47
6. Respiratory „	34	2	—	2	1	3	3·34
7. Digestive „	57	1	—	1	—	1	2·73
8. Lymphatic and Glandular System	30	—	—	—	1	—	3·10
9. Urinary System	5	—	—	—	—	2	·58
10. Generative „	70	—	—	—	—	2	6·38
11. Organs of Locomotion	15	—	—	—	—	—	1·42
12. Connective Tissue	32	—	—	—	—	—	1·83
13. Skin	86	—	—	—	1	1	5·86
III.—POISONS	1	—	—	—	—	—	·02
IV.—INJURIES.							
1. General	—	—	—	—	—	—	—
2. Local	47	—	—	—	—	—	2·64
3. In Action	—	—	—	—	—	—	—
No appreciable disease	—	—	—	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	2,015	15	—	15	10	27	97·57

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent to West Indies.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent to West Indies.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	·4	—	—	—	·01
—	—	—	—	—	2·8	—	—	—	·07
—	—	—	—	—	·4	·28	—	—	·05
—	—	—	—	—	5·9	—	—	—	·11
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
6·2	—	—	—	·67	17·2	·71	·42	—	1·06
—	—	—	—	—	12·1	·14	—	—	·43
6·2	—	—	—	·67	38·8	1·13	·42	—	1·73
1327·2	5·16	1·03	—	33·67	965·8	7·04	3·24	·14	26·21
—	—	—	—	—	1·0	·14	—	—	·01
76·4	—	—	—	6·57	44·9	—	·14	—	4·31
51·6	—	2·06	6·19	5·65	46·3	—	5·77	2·68	4·88
94·9	—	—	—	6·26	135·6	—	—	—	8·04
222·9	—	2·06	6·19	18·48	228·8	—	5·91	2·68	17·23
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	3·8	—	—	—	·05
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·8	—	—	—	·04
11·3	—	—	—	·94	18·6	—	6·90	·28	1·30
60·9	—	—	2·06	6·21	83·8	·14	4·06	1·13	5·53
15·5	5·16	—	4·13	5·00	10·7	4·22	4·08	1·55	1·51
5·2	—	1·03	2·06	·85	3·0	·14	1·55	·70	·23
4·1	1·03	—	1·03	·86	11·8	·56	1·13	·42	·93
2·1	—	1·03	1·03	·28	1·5	—	·28	·28	·12
11·3	—	—	—	·95	22·1	—	·99	·56	1·39
3·1	—	—	—	·40	6·8	—	·56	·56	·51
20·6	1·03	2·06	2·06	3·58	15·6	1·27	2·54	1·27	1·00
35·1	2·06	1·03	3·10	3·45	58·1	2·11	·70	·28	2·86
52·8	1·03	—	1·03	2·82	69·8	·71	·56	·28	2·28
31·0	—	1·03	—	3·20	46·3	—	·99	·28	4·13
5·2	—	—	2·06	·60	5·3	1·69	·85	·28	·52
72·2	—	—	2·06	6·58	87·1	—	·70	·42	6·15
15·5	—	—	—	1·46	11·1	·14	1·69	·85	1·04
33·0	—	—	—	1·89	33·2	·14	·28	—	2·06
88·8	—	1·03	1·03	6·05	142·8	—	·42	·14	6·37
1·0	—	—	—	·03	—	—	—	—	—
—	—	—	—	—	·3	·56	—	—	—
48·5	—	—	—	2·72	73·6	·56	·14	·85	3·28
—	—	—	—	—	3·4	·28	·42	—	·28
—	—	—	—	—	1·1	—	—	—	·06
—	—	—	—	—	—	—	—	—	—
2079·5	15·48	10·32	27·86	100·69	1940·4	20·83	33·43	12·93	86·78

ABSTRACT No. IX.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS
the TROOPS stationed at SOUTH AFRICA and ST. HELENA during the Year 1896,

Average Strength, 4,412.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
Diseases.		In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally discharged the Service.	
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Sub-Group I. Other Eruptive Fevers	6	—	—	—	—	—	·66
Sub-Group I. Enteric Fever	45	10	—	10	1	—	8·11
Sub-Group I. Other Continued Fevers	153	—	—	—	—	—	7·28
Sub-Group I. Yellow Fever	—	—	—	—	—	—	—
Sub-Group I. Cholera	—	—	—	—	—	—	—
Sub-Group I. Dysentery	59	1	—	1	—	—	2·62
Sub-Group I. Other Diseases	2	—	—	—	—	—	·14
Total	265	11	—	11	1	—	18·81
Sub-Group II.—Malarial Fevers	39	—	—	—	2	—	1·24
Sub-Group III.—Septic Diseases	2	—	—	—	—	—	·22
Sub-Group IV. Syphilis, Primary	304	—	—	—	—	—	28·82
Sub-Group IV. „ Secondary	145	—	—	—	9	2	18·52
Sub-Group IV. Gonorrhœa	486	—	—	—	6	1	43·01
Total	935	—	—	—	15	3	90·35
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	4	—	—	—	—	—	·07
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Sub-Group II. Alcoholism	5	—	—	—	—	—	·23
GROUP "C."							
Debility, &c.	23	—	—	—	3	2	1·76
GROUP "D."							
Rheumatism	159	—	—	—	2	3	11·72
Tubercular Diseases	11	2	—	2	5	5	2·14
Other Diseases	23	—	—	—	1	—	1·60
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System { Nervous Diseases	34	—	—	—	5	5	2·41
1. Nervous System { Mental „	4	—	—	—	2	6	·37
2. Eye	52	—	—	—	3	1	3·63
3 & 4. Other Organs of Special Sense	42	—	—	—	6	4	3·17
5. Circulatory System	25	1	—	1	3	2	1·99
6. Respiratory „	113	—	—	—	2	—	6·93
7. Digestive „	591	2	—	2	2	2	18·49
8. Lymphatic and Glandular System	96	—	—	—	1	—	11·03
9. Urinary System	7	3	—	3	1	—	·55
10. Generative „	85	—	—	—	—	—	5·46
11. Organs of Locomotion	58	—	—	—	2	3	4·36
12. Connective Tissue	173	—	—	—	—	—	6·58
13. Skin	343	—	—	—	4	1	15·62
III.—POISONS	2	—	—	—	—	—	·11
IV.—INJURIES.							
1. General	9	—	—	—	—	—	·53
2. Local	694	2	—	2	4	4	29·96
3. In Action	—	—	—	—	—	—	—
No appreciable disease	16	—	—	—	—	—	·79
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	3,810	21	—	21	64	41	240·11

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among with the Ratios per 1,000 of the Strength, and the average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
1·4	—	—	—	·15	1·0	—	—	—	·06
10·2	2·27	·23	—	1·84	8·8	1·66	·03	—	1·34
34·7	—	—	—	1·65	37·2	·03	—	—	1·66
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
13·4	·23	—	—	·59	6·1	·12	·50	·06	·56
·4	—	—	—	·03	9·4	—	—	—	·28
60·1	2·49	·23	—	4·26	62·5	1·81	·53	·06	3·90
8·8	—	·45	—	·28	23·0	·06	·32	·03	·85
·5	—	—	—	·05	1·9	—	·03	—	·12
68·9	—	—	—	6·53	87·1	—	·03	—	7·27
32·9	—	2·04	·45	4·20	55·6	·27	3·05	1·36	5·32
110·1	—	1·36	·23	9·75	105·3	—	·26	·06	7·62
211·9	—	3·40	·68	20·48	248·0	·27	3·34	1·42	20·21
—	—	—	—	—	—	—	—	—	—
·9	—	—	—	·62	2·3	—	—	·09	·04
—	—	—	—	—	—	—	—	—	·01
1·1	—	—	—	·05	3·5	·03	·03	—	·09
5·2	—	·68	·45	·40	13·3	—	3·25	1·24	1·30
36·0	—	·45	·68	2·65	38·8	·09	1·45	·47	2·70
2·5	·45	1·13	1·13	·49	2·8	·59	1·36	1·12	·54
5·2	—	·23	—	·36	5·4	·12	·53	·32	·45
7·7	—	1·13	1·13	·55	8·1	·44	1·69	1·48	·71
·9	—	·45	1·36	·08	1·1	·09	·98	·86	·25
11·8	—	·68	·23	·82	15·4	—	·89	·74	1·05
9·5	—	1·36	·91	·72	8·2	·03	·89	·80	·67
5·7	·23	·68	·45	·45	10·7	·35	3·52	2·49	1·34
25·6	—	·45	—	1·57	26·9	·59	1·15	·65	1·73
134·0	·45	·45	·45	4·19	98·1	·44	1·30	·83	3·40
21·8	—	·23	—	2·50	31·1	—	·15	·15	3·10
1·6	·68	·23	—	·12	3·4	·12	·56	·32	·33
19·3	—	—	—	1·24	44·2	—	·35	·32	2·82
13·1	—	·45	·68	·99	8·9	·03	·77	·77	·65
39·2	—	—	—	1·49	28·2	—	·03	—	1·23
77·7	—	·91	·23	3·54	60·2	—	·27	·15	2·68
·5	—	—	—	·03	·3	·03	—	—	—
2·0	—	—	—	·12	1·3	·86	·18	·03	·08
157·3	·45	·91	·91	6·79	112·1	·59	·98	·62	4·91
—	—	—	—	—	—	—	—	·06	—
3·6	—	—	—	·18	2·2	·06	—	—	·09
—	—	—	—	—	—	—	—	—	—
863·5	4·76	14·50	9·29	54·42	861·9	6·60	24·55	15·02	55·25

ABSTRACT No. X.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS
the TROOPS stationed at MAURITIUS during the Year 1896, with the

Average Strength, 676.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
Diseases.		In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Enteric Fever	10	3	—	3	—	—	2·14
Other Continued Fevers	1	—	—	—	—	—	·23
Yellow Fever	—	—	—	—	—	—	—
Cholera	—	—	—	—	—	—	—
Dysentery	13	1	—	1	1	—	1·02
Other Diseases	—	—	—	—	—	—	—
Total	24	4	—	4	1	—	3·39
Sub-Group II.—Malarial Fevers	292	1	—	1	22	—	17·79
Sub-Group III.—Septic Diseases	—	—	—	—	—	—	·06
Sub-Group IV. Syphilis, Primary	26	—	—	—	—	—	2·98
„ Secondary	33	—	—	—	2	—	3·99
Gonorrhœa	90	—	—	—	—	—	7·59
Total	149	—	—	—	2	—	14·56
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	2	—	—	—	—	—	·03
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Alcoholism	3	—	—	—	—	—	·12
GROUP "C."							
Debility, &c.	9	—	—	—	3	—	·75
GROUP "D."							
Rheumatism	9	—	—	—	3	1	1·17
Tubercular Diseases	—	—	—	—	—	—	—
Other Diseases	7	—	—	—	—	—	·41
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System Nervous Diseases	3	—	—	—	—	—	·08
Mental „	—	—	—	—	—	1	—
2. Eye	3	—	—	—	—	—	·21
3 & 4. Other Organs of Special Sense	4	—	—	—	—	—	·28
5. Circulatory System	5	1	—	1	2	4	·41
6. Respiratory „	9	—	—	—	—	—	·26
7. Digestive „	76	—	—	—	—	—	2·40
8. Lymphatic and Glandular System	27	—	—	—	—	—	4·58
9. Urinary System	—	—	—	—	—	—	—
10. Generative „	28	—	—	—	—	—	2·33
11. Organs of Locomotion	11	—	—	—	—	—	·60
12. Connective Tissue	12	—	—	—	—	—	·35
13. Skin	36	—	—	—	—	—	1·69
III.—POISONS	—	—	—	—	—	—	—
IV.—INJURIES.							
1. General	—	—	—	—	—	—	—
2. Local	85	—	—	—	1	—	4·26
3. In Action	—	—	—	—	—	—	—
No appreciable disease	5	—	—	—	—	—	·17
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	799	6	—	6	34	6	55·90

into Hospital, Deaths, Numbers Invalided and Constantly Sick among Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000, from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	·2	—	—	—	·02
—	—	—	—	—	1·0	—	—	—	·08
14·3	4·44	—	—	3·16	13·9	5·01	·19	—	1·70
1·5	—	—	—	·34	1·5	·77	—	—	·08
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
19·2	1·48	1·48	—	1·51	22·1	·77	·97	—	1·43
—	—	—	—	—	2·5	—	—	—	·07
35·5	5·92	1·48	—	5·01	41·2	6·55	1·16	—	3·38
432·0	1·48	32·54	—	26·32	614·2	3·47	27·17	1·35	25·59
—	—	—	—	·09	1·3	·19	—	—	·05
38·5	—	—	—	4·41	42·6	—	—	—	3·33
48·8	—	2·96	—	5·90	31·0	—	2·51	1·35	2·78
133·1	—	—	—	11·23	103·1	—	—	—	6·74
220·4	—	2·96	—	21·54	176·7	—	2·51	1·35	12·85
—	—	—	—	—	—	—	—	—	—
3·0	—	—	—	·04	2·7	—	—	·19	·06
—	—	—	—	—	·2	—	—	—	·01
4·4	—	—	—	·18	2·9	·19	—	—	·07
13·3	—	4·44	—	1·11	15·4	·19	5·78	1·54	·88
13·3	—	4·44	1·48	1·73	21·2	—	·77	·58	1·16
—	—	—	—	—	3·1	·77	1·93	1·73	·42
10·4	—	—	—	·61	6·0	—	·19	—	·37
4·4	—	—	—	·12	10·0	·77	1·73	1·73	·62
—	—	—	1·48	—	3·1	·19	2·51	2·89	·48
4·4	—	—	—	·31	13·1	—	1·73	·77	1·06
5·9	—	—	—	·41	16·9	—	1·73	1·16	·97
7·4	1·48	2·96	5·92	·61	15·4	·39	3·08	2·70	1·11
13·3	—	—	—	·38	24·1	—	·58	·19	1·42
112·4	—	—	—	3·55	115·8	1·54	1·93	·39	4·27
39·9	—	—	—	6·77	45·1	—	—	·19	5·13
—	—	—	—	—	5·4	·19	1·73	·77	·52
41·4	—	—	—	3·45	57·4	—	·19	·39	3·77
16·3	—	—	—	·89	8·5	—	—	—	·55
17·8	—	—	—	·52	20·6	—	—	—	·85
53·3	—	—	—	2·50	60·7	—	—	—	2·58
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	1·2	1·16	·19	—	·02
125·7	—	1·48	—	6·30	108·7	·77	·39	·39	4·47
—	—	—	—	—	—	—	—	—	—
7·4	—	—	—	·25	3·5	—	—	—	·10
—	—	—	—	—	—	—	—	—	—
1181·9	8·88	50·30	8·88	82·69	1394·4	16·37	55·30	18·30	72·76

ABSTRACT No. XI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the Troops stationed at CEYLON during the Year 1896, with the Ratios

Average Strength, 1,336. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Sub-Group I. Other Eruptive Fevers	11	—	—	—	—	—	·30
Sub-Group I. Enteric Fever	6	1	—	1	—	—	·89
Sub-Group I. Other Continued Fevers	16	—	—	—	—	—	·60
Sub-Group I. Yellow Fever	—	—	—	—	—	—	—
Sub-Group I. Cholera	—	—	—	—	—	—	—
Sub-Group I. Dysentery	24	1	—	1	—	—	1·52
Sub-Group I. Other Diseases	—	—	—	—	—	—	—
Total	57	2	—	2	—	—	3·31
Sub-Group II.—Malarial Fevers	386	3	—	3	6	—	10·39
Sub-Group III.—Septic Diseases	—	—	—	—	—	—	—
Sub-Group IV. Syphilis, Primary	183	—	—	—	—	—	12·80
Sub-Group IV. „ Secondary	63	—	—	—	5	2	4·20
Sub-Group IV. Gonorrhœa	199	—	—	—	1	—	13·58
Total	445	—	—	—	6	2	30·58
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	3	—	—	—	—	—	·07
Sub-Group II. Scurvy	1	—	—	—	—	—	·03
Sub-Group II. Alcoholism	7	—	—	—	—	—	·14
GROUP "C."							
Debility, &c.	30	—	—	—	3	—	1·80
GROUP "D."							
Rheumatism	27	1	—	1	1	1	1·87
Tubercular Diseases	3	—	—	—	2	2	·45
Other Diseases	12	—	—	—	2	1	·81
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System: Nervous Diseases	7	—	—	—	—	—	·25
1. Nervous System: Mental „	1	—	—	—	—	1	·19
2. Eye	17	—	—	—	—	—	·51
3 & 4. Other Organs of Special Sense	29	—	—	—	—	—	1·00
5. Circulatory System	9	1	—	1	1	—	1·12
6. Respiratory „	17	—	—	—	1	1	1·00
7. Digestive „	122	—	—	—	7	—	4·47
8. Lymphatic and Glandular System	77	—	—	—	—	—	7·19
9. Urinary System	2	—	—	—	—	—	·05
10. Generative „	57	—	—	—	—	—	3·87
11. Organs of Locomotion	24	—	—	—	—	1	1·08
12. Connective Tissue	63	—	—	—	—	—	2·72
13. Skin	214	—	—	—	1	—	7·54
III.—POISONS	—	—	—	—	—	—	—
IV.—INJURIES.							
1. General	1	3	—	3	—	—	·01
2. Local	144	1	—	1	1	1	6·11
3. In Action	—	—	—	—	—	—	—
No appreciable disease	10	—	—	—	—	—	·26
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	1,765	11	—	11	31	10	86·73

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
8·2	—	—	—	·22	·3	—	—	—	·01
4·5	·75	—	—	·67	8·1	2·99	—	—	·93
12·0	—	—	—	·45	65·5	·17	—	—	2·13
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·1	·08	—	—	—
18·0	·75	—	—	1·14	20·5	·91	1·41	·25	1·60
—	—	—	—	—	3·1	—	—	—	·06
42·7	1·50	—	—	2·48	97·6	4·15	1·41	·25	4·73
288·9	2·24	4·49	—	7·78	40·4	·42	·25	—	1·37
—	—	—	—	—	·6	—	—	—	·01
137·0	—	—	—	9·58	71·3	—	·08	—	6·08
47·2	—	3·74	1·50	3·14	54·5	—	2·49	1·83	4·53
148·9	—	·75	—	10·17	132·0	—	·25	·17	7·42
333·1	—	4·49	1·50	22·89	257·8	—	2·82	2·00	18·08
—	—	—	—	—	—	—	—	—	—
2·3	—	—	—	·05	1·3	—	—	—	·02
·7	—	—	—	·01	—	—	—	—	—
5·2	—	—	—	·10	5·2	·17	—	—	·18
23·5	—	2·24	—	1·35	16·7	—	2·66	1·33	·96
20·2	·75	·75	·75	1·40	31·1	—	·25	—	1·63
2·3	—	1·50	1·50	·34	3·3	·91	2·16	1·99	·59
9·0	—	1·50	·75	·61	11·1	·08	·58	·33	·69
5·2	—	—	—	·19	9·1	·42	1·49	1·00	·54
·7	—	—	·75	·07	1·3	—	1·25	1·16	·49
12·7	—	—	—	·38	13·1	—	·66	·58	·70
21·7	—	—	—	·75	15·6	—	·25	·25	·60
6·7	·75	·75	—	·84	8·4	1·16	1·49	·91	·74
12·7	—	·75	·75	·75	24·9	·58	·83	·42	1·39
91·3	—	5·24	—	3·35	103·2	1·58	1·41	·33	3·72
57·6	—	—	—	5·38	62·0	—	·25	—	6·66
1·5	—	—	—	·04	2·5	—	·25	·25	·20
42·7	—	—	—	2·90	94·6	—	·42	·08	6·07
18·0	—	—	·75	·81	6·7	—	·58	·50	·51
47·2	—	—	—	2·03	26·9	—	—	—	1·07
160·2	—	·75	—	5·64	70·1	—	—	—	2·94
—	—	—	—	—	—	—	—	—	—
·7	2·24	—	—	—	1·7	1·49	·17	·03	·11
107·8	·75	·75	·75	4·57	94·3	·42	·42	·33	3·73
—	—	—	—	—	—	—	—	—	—
7·5	—	—	—	·20	4·6	—	—	—	·09
—	—	—	—	—	—	—	—	—	—
1321·1	8·23	23·20	7·48	64·91	1004·1	11·38	19·60	11·79	57·82

ABSTRACT No. XII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS among the TROOPS stationed in CHINA during the Year 1896, with the

Average Strength, 1,470.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
Diseases.		In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Sub-Group I. Other Eruptive Fevers	—	—	—	—	—	—	—
Sub-Group I. Enteric Fever	11	1	—	1	1	—	2·26
Sub-Group I. Other Continued Fevers	183	—	—	—	—	—	6·00
Sub-Group I. Bubonic Plague	3	2	—	2	—	—	·10
Sub-Group I. Cholera	1	1	—	1	—	—	·01
Sub-Group I. Dysentery	8	—	—	—	1	—	·60
Sub-Group I. Other Diseases	1	—	—	—	—	—	·07
Total	207	4	—	4	2	—	9·04
Sub-Group II.—Malarial Fevers	871	—	—	—	34	3	22·29
Sub-Group III.—Septic Diseases	1	—	—	—	—	—	·08
Sub-Group IV. Syphilis, Primary	96	—	—	—	—	—	8·10
Sub-Group IV. " Secondary	156	—	—	—	6	—	12·23
Sub-Group IV. Gonorrhœa	277	—	—	—	—	—	17·91
Total	529	—	—	—	6	—	38·24
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	3	—	—	—	—	—	·03
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Sub-Group II. Alcoholism	2	—	—	—	—	—	·10
GROUP "C."							
Debility, &c.	50	—	—	—	15	11	1·63
GROUP "D."							
Rheumatism	55	—	—	—	2	1	2·35
Tubercular Diseases	3	—	—	—	2	5	·69
Other Diseases	28	1	—	1	1	—	2·37
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System { Nervous Diseases	14	1	—	1	—	—	·50
1. Nervous System { Mental "	2	—	—	—	2	2	·60
2. Eye	21	—	—	—	3	2	·75
3 & 4. Other Organs of Special Sense	46	—	—	—	7	4	2·59
5. Circulatory System	30	2	—	2	10	8	2·83
6. Respiratory "	32	—	—	—	4	2	2·29
7. Digestive "	194	2	—	2	1	1	5·38
8. Lymphatic and Glandular System	48	—	—	—	—	—	5·79
9. Urinary System	7	—	—	—	—	1	·17
10. Generative "	233	—	—	—	—	—	19·30
11. Organs of Locomotion	17	—	—	—	—	4	·59
12. Connective Tissue	51	—	—	—	—	—	1·46
13. Skin	141	—	—	—	—	—	5·34
III.—POISONS	—	—	—	—	—	—	—
IV.—INJURIES.							
1. General	3	1	—	1	—	—	·08
2. Local	139	—	—	—	1	2	4·21
3. In Action	—	—	—	—	—	—	—
No appreciable disease	2	—	—	—	—	—	·03
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	2,729	11	—	11	90	46	128·73

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	1·1	—	—	—	·08
—	—	—	—	—	·1	—	—	—	·01
7·5	·68	·68	—	1·56	1·3	·52	·07	—	·12
124·5	—	—	—	4·08	10·3	—	—	—	·35
2·0	1·36	—	—	·07	—	—	—	—	—
·7	·68	—	—	·01	·5	·37	—	—	—
5·4	—	·68	—	·41	13·8	·45	·82	—	·76
·7	—	—	—	·06	4·2	·07	—	—	·23
140·8	2·72	1·36	—	6·15	31·8	1·41	·89	—	1·55
592·5	—	23·13	2·04	15·16	450·6	2·68	5·80	·82	13·01
·7	—	—	—	·05	·4	—	—	—	·01
65·3	—	—	—	5·51	37·1	—	—	—	3·50
106·1	—	4·08	—	8·32	49·0	·15	2·30	·82	3·52
183·4	—	—	—	12·18	135·5	—	·22	—	9·03
359·8	—	4·03	—	26·01	221·6	·15	2·53	·82	16·05
—	—	—	—	—	—	—	—	—	—
2·0	—	—	—	·02	·8	—	—	—	·01
—	—	—	—	—	—	·07	—	—	—
1·4	—	—	—	·07	3·6	·15	·07	—	·18
34·0	—	10·20	7·48	1·11	20·9	·07	3·79	1·49	·98
37·4	—	1·36	·68	1·60	18·0	—	·74	·22	·88
2·0	—	1·36	3·40	·47	4·7	·97	2·45	1·04	·83
19·0	·68	·68	—	1·61	7·5	·22	·74	·22	·56
9·5	·68	—	—	·34	5·0	·45	·52	·59	·34
1·4	—	1·36	1·36	·41	1·3	·07	·67	·67	·22
14·3	—	2·04	1·36	·51	8·3	—	·59	·30	·46
31·3	—	4·76	2·72	1·76	13·5	—	·52	·30	·50
20·4	1·36	6·80	5·44	1·93	12·8	1·04	3·05	2·38	·97
21·8	—	2·72	1·36	1·56	27·6	·37	1·12	·59	1·49
132·0	1·36	·68	·68	3·66	93·5	·67	2·23	·74	3·73
32·7	—	—	—	3·94	25·1	—	·30	·30	2·41
4·8	—	—	·68	·12	3·6	·22	·45	·15	·38
153·5	—	—	—	13·13	123·6	·07	·07	·07	9·35
11·6	—	—	2·72	·40	9·3	—	1·04	·59	·64
34·7	—	—	—	·99	24·2	—	·22	·07	1·09
95·9	—	—	—	3·63	51·1	—	·15	—	2·04
—	—	—	—	—	·3	—	—	—	—
2·0	·68	—	—	·05	1·6	1·79	—	—	·09
94·3	—	·68	1·36	2·86	86·0	1·04	·74	·67	3·58
—	—	—	—	—	—	—	—	—	—
1·4	—	—	—	·02	·8	—	—	—	·04
—	—	—	—	—	—	—	—	—	—
1836·5	7·46	61·22	31·29	87·57	1256·0	11·44	28·68	12·03	61·39

ABSTRACT No. XIII.—TABLE showing the AVERAGE STRENGTH, ADMIS- among the TROOPS stationed in the STRAITS SETTLEMENTS during Ratios for 10 years.

Average Strength, 1,352.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
Diseases.		In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I. Small-pox	—	—	—	—	—	—	—
Sub-Group I. Other Eruptive Fevers	—	—	—	—	—	—	—
Sub-Group I. Enteric Fever	1	—	—	—	—	—	·14
Sub-Group I. Other Continued Fevers	83	—	—	—	—	—	3·04
Sub-Group I. Yellow Fever	—	—	—	—	—	—	—
Sub-Group I. Cholera	—	—	—	—	—	—	—
Sub-Group I. Dysentery	3	—	—	—	—	—	·50
Sub-Group I. Other Diseases	16	—	—	—	—	—	·59
Total	103	—	—	—	—	—	4·27
Sub-Group II.—Malarial Fevers	144	3	—	3	1	—	4·86
Sub-Group III.—Septic Diseases	—	—	—	—	—	—	—
Sub-Group IV. Syphilis, Primary	227	—	—	—	—	—	19·43
Sub-Group IV. " Secondary	181	1	—	1	7	—	19·14
Sub-Group IV. Gonorrhœa	240	—	—	—	—	—	16·18
Total	648	1	—	1	7	—	54·75
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	2	—	—	—	—	—	·10
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Sub-Group II. Alcoholism	3	—	—	—	—	—	·19
GROUP "C."							
Debility, &c.	5	—	—	—	1	—	·52
GROUP "D."							
Rheumatism	27	—	—	—	5	—	3·53
Tubercular Diseases	2	—	1	1	1	2	·43
Other Diseases	7	—	—	—	—	—	·53
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System, Nervous Diseases	16	2	—	2	2	1	·85
1. Nervous System, Mental "	2	—	—	—	—	—	·09
2. Eye	26	—	—	—	—	—	1·16
3 & 4. Other Organs of Special Sense	8	—	—	—	—	—	·45
5. Circulatory System	4	—	—	—	1	—	·41
6. Respiratory "	19	—	—	—	—	—	1·19
7. Digestive "	70	2	1	3	—	—	2·69
8. Lymphatic and Glandular System	51	—	—	—	1	—	5·81
9. Urinary System	3	1	—	1	—	—	·23
10. Generative "	64	—	—	—	—	—	3·97
11. Organs of Locomotion	13	—	—	—	1	—	·74
12. Connective Tissue	88	—	—	—	—	—	1·83
13. Skin	75	—	—	—	—	—	3·91
III.—POISONS	—	—	—	—	—	—	—
IV.—INJURIES.							
1. General	—	—	—	—	—	—	—
2. Local	115	1	—	1	—	—	4·70
3. In Action	—	—	—	—	—	—	—
No appreciable disease	8	—	—	—	—	—	·53
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	1,453	10	2	12	20	3	97·74

sions into Hospital, Deaths, Numbers Invalided and Constantly Sick the Year 1896, with the Ratios per 1,000 of the Strength, and the Average

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	·2	—	—	—	·01
—	—	—	—	—	·2	—	—	—	·01
·7	—	—	—	·10	2·5	1·09	—	—	·38
61·4	—	—	—	2·25	68·8	·08	·08	—	2·35
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·1	·08	—	—	—
2·2	—	—	—	·37	7·4	·17	·67	·08	·79
11·9	—	—	—	·44	·8	—	—	—	·03
76·2	—	—	—	3·16	80·0	1·42	·75	·08	3·57
106·5	2·22	·74	—	3·60	106·7	·33	·17	—	3·23
—	—	—	—	—	·2	—	—	—	—
167·9	—	—	—	14·37	111·2	—	—	—	9·94
133·9	·74	5·18	—	14·15	98·9	·25	4·68	1·08	10·18
177·5	—	—	—	11·97	151·6	—	·50	·17	10·64
479·3	·74	5·18	—	40·49	361·7	·25	5·18	1·25	30·76
—	—	—	—	—	·1	·08	—	—	—
1·5	—	—	—	·08	3·0	—	—	—	·06
—	—	—	—	—	—	—	—	—	—
2·2	—	—	—	·14	7·2	·33	—	—	·29
3·7	—	·74	—	·39	15·4	—	1·76	1·42	1·62
20·0	—	3·70	—	2·61	12·5	—	·42	·17	1·00
1·5	·74	·74	1·48	·32	2·4	·92	1·76	·92	·68
5·2	—	—	—	·38	7·2	·17	·08	—	·45
11·9	1·48	1·48	·74	·63	5·8	·50	·33	·34	·29
1·5	—	—	—	·07	1·5	·08	1·25	1·25	·33
19·3	—	—	—	·86	18·0	—	·42	·25	·96
5·9	—	—	—	·33	14·4	—	·08	·08	·53
3·0	—	·74	—	·30	4·8	·33	1·42	1·59	·72
14·1	—	—	—	·88	21·5	·84	1·09	·34	1·55
51·8	2·22	—	—	1·99	68·9	·42	·67	·34	2·87
37·7	—	·74	—	4·30	39·7	—	·08	·08	4·78
2·2	·74	—	—	·17	2·5	·16	·33	·25	·37
47·4	—	—	—	2·94	96·7	·08	·50	·67	6·71
9·6	—	·74	—	·55	7·5	—	·33	·42	·50
28·1	—	—	—	1·35	32·6	—	·08	—	1·42
55·5	—	—	—	2·80	69·5	—	—	·08	3·14
—	—	—	—	—	·2	—	—	—	—
—	—	—	—	—	2·5	1·09	—	—	·16
84·5	·74	—	—	3·48	94·0	·25	·59	·42	4·01
—	—	—	—	—	—	—	—	—	—
5·9	—	—	—	·38	2·9	—	—	—	·09
—	—	—	—	—	—	—	—	—	—
1074·7	8·88	14·79	2·22	72·29	1079·4	7·27	17·29	9·94	70·09

ABSTRACT No. XIV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS, DEATHS, &c., among the Troops stationed in INDIA during the Year 1896, with

Average Strength, 70,424.		Admissions into Hospital.	Deaths			Invalids.	
Diseases.			In the Command.	Of Invalids.	Total.	No. sent Home.	No. finally discharged the Service.
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I.	Small-pox	122	10	—	10	—	—
	Other Eruptive Fevers	82	2	—	2	—	—
	Enteric Fever	1,795	445	—	445	36	3
	Other Continued Fevers	2,112	—	—	—	2	—
	Yellow Fever	—	—	—	—	—	—
	Cholera	70	63	—	63	—	—
	Dysentery	1,841	47	1	48	81	8
	Other Diseases	822	8	—	8	1	—
	Total	6,844	575	1	576	120	11
Sub-Group II.—Malarial Fevers		17,825	35	2	37	136	23
Sub-Group III.—Septic Diseases		112	12	—	12	1	—
Sub-Group IV.	Syphilis, Primary	11,228	—	—	—	6	—
	„ Secondary	6,888	13	3	16	448	134
	Gonorrhœa	13,209	1	—	1	23	8
	Total	31,325	14	3	17	477	142
Sub-Group V.—Hydrophobia, &c.		3	3	—	3	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases		193	—	—	—	—	—
Sub-Group II.	Scurvy	18	—	—	—	—	—
	Alcoholism	293	4	—	4	1	—
GROUP "C."							
Debility, &c.		1,205	1	—	1	185	34
GROUP "D."							
Rheumatism		2,198	1	—	1	50	30
Tubercular Diseases		354	51	13	64	141	116
Other Diseases		492	5	—	5	50	28
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System	Nervous Diseases	577	14	1	15	70	48
	Mental „	93	1	—	1	74	58
2. Eye		796	—	—	—	42	33
3 & 4. Other Organs of Special Sense		1,157	—	—	—	73	52
5. Circulatory System		692	36	1	37	158	123
6. Respiratory „		2,209	55	3	58	28	14
7. Digestive „		8,494	105	3	108	126	47
8. Lymphatic and Glandular System		2,187	1	—	1	21	6
9. Urinary System		154	13	2	15	30	19
10. Generative „		5,555	—	—	—	22	12
11. Organs of Locomotion		783	1	1	2	73	44
12. Connective Tissue		1,759	—	—	—	3	3
13. Skin		4,820	1	—	1	9	6
III.—POISONS		34	8	—	8	4	—
IV.—INJURIES.							
1. General		288	70	—	70	13	7
2. Local		7,129	39	2	41	59	30
3. In Action		—	—	—	—	—	—
No appreciable disease		164	—	—	—	—	—
Cause unknown (refers to deaths only)		—	1	—	1	—	—
General Total		97,738	1,046	32	1,078	1,966	890

SIONS into HOSPITAL, DEATHS, NUMBERS INVALIDED, and CONSTANTLY the Ratios per 1,000 of the Strength, and the average Ratios for 10 Years.

Average Number constantly Sick.	Ratio per 1,000.					Average Ratio per 1 000 from 1886 to 1895.				
	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged	Constantly Sick.
11·49	1·7	·14	—	—	·16	·7	·07	—	—	·07
3·57	1·2	·03	—	—	·05	1·7	·01	—	—	·06
259·86	25·5	6·31	·51	·04	3·69	19·2	5·16	·25	·01	2·70
107·24	30·0	—	·03	—	1·52	56·2	·04	·02	·01	2·24
—	—	—	—	—	—	—	—	—	—	—
·78	1·0	·89	—	—	·01	1·9	1·32	—	—	·05
127·73	26·1	·68	1·15	·12	1·81	28·8	·72	1·03	·19	1·98
61·54	11·7	·11	·01	—	·87	6·9	·02	—	--	·21
572·21	97·1	8·17	1·70	·16	8·12	115·4	7·34	1·31	·21	7·30
715·51	252·9	·53	1·93	·33	10·15	359·9	·72	1·90	·36	11·54
6·60	1·6	·17	·01	—	·09	1·5	·10	—	—	·10
1022·14	159·3	—	·09	—	14·50	123·0	—	·02	—	10·32
738·22	97·7	·23	6·36	1·90	10·47	55·8	·11	2·79	·98	5·57
1036·22	187·4	·01	·33	·12	14·70	173·0	—	·15	·04	12·46
2796·58	444·4	·24	6·77	2·01	39·68	351·8	·11	2·96	1·03	28·36
·03	—	·04	—	—	—	—	·04	—	—	—
6·42	2·7	—	—	—	·09	3·4	—	·01	—	·09
·81	·3	—	—	—	·01	·7	—	·01	—	·04
11·84	4·2	·06	·01	—	·17	8·4	·08	·01	—	·26
91·29	17·1	·01	2·62	·48	1·30	24·1	·04	3·27	1·44	1·58
168·19	31·2	·01	·71	·43	2·39	29·8	·06	·96	·36	2·05
59·19	5·0	·91	2·00	1 64	·84	3·5	·82	1·38	1·03	·66
38·02	6·9	·07	·71	·40	·54	10·6	·14	·65	·22	·72
47·03	8·2	·21	·90	·59	·67	8·8	·36	1·06	·80	·59
23·18	1·3	·01	1·05	·82	·40	1·7	·01	1·21	1·34	·50
48·78	11·2	—	·30	·47	·69	13·1	—	·56	·55	·80
66·09	16·4	—	1·04	·74	·94	14·8	·01	·83	·66	·75
64·40	9·8	·53	2·24	1·74	·91	10·7	·38	2·71	2·18	1·09
131·43	31·3	·83	·40	·20	1·86	34·2	·93	·68	·33	1·93
334·48	120·5	1·53	1·79	·66	5·45	131·5	1·82	1·99	·64	5·53
245·89	31·0	·01	·30	·09	3·49	31·9	·03	·40	·17	3·48
17·58	2·2	·21	·43	·27	·25	2·1	·17	·31	·18	·21
422·23	78·8	—	·31	·17	5·99	87·3	·02	·27	·22	5·99
59·69	11·2	·03	1·04	·62	·85	7·6	·03	·70	·57	·59
81·96	25·0	—	·04	·04	1·16	21·6	·01	·11	·03	1·03
203·83	68·4	·01	·13	·09	2·89	68·8	—	·15	·05	2·85
·54	·5	·12	·06	—	·01	·5	·09	·01	—	·02
16·72	4·1	1·00	·18	·10	·24	3·3	1·43	·11	·03	·17
320·24	101·1	·58	·84	·43	4·54	104·3	·75	·93	·64	4·59
—	—	—	—	—	—	·1	·03	·02	·05	·01
8·98	2·3	—	—	—	·13	2·1	—	—	—	·09
—	—	·01	—	—	—	—	—	—	—	—
6614·74	1386·7	15·29	27·89	12·48	93·85	1453·5	15·52	24·51	13·09	83·92

ABSTRACT No. XV.—TABLE, taken from the REPORT of the PRINCIPAL CLASSES of DISEASES in each of the MILITARY DISTRICTS in INDIA,

Military Districts.	Presidency.		Allahabad.		Oudh.		Rohilkhand.		Narbudda.	
Average Strength	2,984		2,493		4,099		3,369		1,316	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I.—GENERAL DISEASES.										
GROUP "A."										
Sub-Group I.										
Small-pox	—	—	21	—	9	—	1	2	—	—
Other Eruptive Fevers	4	—	28	—	2	—	6	—	5	—
Enteric Fever	45	10	169	41	131	43	124	25	31	7
Other Continued Fevers	15	—	280	—	255	—	88	—	8	—
Yellow Fever	—	—	—	—	—	—	—	—	—	—
Cholera	3	3	14	8	—	—	—	—	2	2
Dysentery	173	5	112	1	173	3	91	1	81	7
Other diseases	—	—	7	—	248	—	105	1	—	—
Total	240	18	631	53	818	46	409	29	127	16
Sub-Group II.—Malarial Fevers	690	8	381	1	1,089	—	373	—	904	3
Sub-Group III.—Septic Diseases	—	—	3	1	5	1	5	1	1	—
Sub-Group IV.										
Syphilis, Primary	272	—	515	—	898	—	1,013	—	121	—
„ Secondary	307	—	176	—	525	1	528	2	105	3
Gonorrhœa	535	—	537	—	1,075	—	857	—	302	—
Total	1,114	—	1,228	—	2,498	1	2,398	2	528	3
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—	—	—	—
GROUP "B."										
Sub-Group I.—Parasitic Diseases	11	—	1	—	22	—	6	—	2	—
Sub-Group II. Scurvy	—	—	1	—	2	—	—	—	2	—
Alcoholism	28	—	6	1	12	—	8	1	3	—
GROUP "C."										
Debility, &c.	72	—	36	—	57	—	46	—	30	—
GROUP "D."										
Rheumatism	56	—	72	—	110	—	126	—	15	—
Tubercular Diseases	11	1	6	2	17	6	21	4	9	2
Other diseases	14	—	9	—	31	—	11	—	7	—
II.—LOCAL DISEASES.										
Diseases of the—										
1. Nervous System: Nervous Diseases	15	—	8	2	36	1	23	—	10	1
Mental „	5	—	6	—	11	—	2	—	—	—
2. Eye	24	—	15	—	47	—	40	—	17	—
3 & 4. Other Organs of Special Sense	39	—	32	—	112	—	32	—	21	—
5. Circulatory System	32	4	19	2	69	6	79	1	6	—
6. Respiratory „	53	1	55	1	128	2	125	2	53	3
7. Digestive „	358	11	303	3	483	17	484	4	151	6
8. Lymphatic and Glandular System	104	—	53	—	204	—	111	—	46	—
9. Urinary System	10	—	2	—	5	1	12	—	2	—
10. Generative „	312	—	234	—	116	—	75	—	347	—
11. Organs of Locomotion	36	—	35	—	43	1	44	—	9	—
12. Connective Tissue	67	—	52	—	115	—	59	—	39	—
13. Skin	177	—	248	—	368	1	197	—	85	—
III.—POISONS	1	—	2	1	3	4	1	—	1	1
IV.—INJURIES.										
1. General	5	5	10	3	20	7	5	3	1	—
2. Local	236	—	161	—	390	4	239	1	142	—
3. In Action	—	—	—	—	—	—	—	—	—	—
No appreciable disease	5	—	6	—	10	—	7	—	7	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—	—	—
General Total	3,715	48	3,615	70	6,826	98	4,943	48	2,565	35

MEDICAL OFFICER, showing the PREVALENCE and MORTALITY of the DIFFERENT with the ratios per 1,000 of Strength, during the year 1896.

Bundelkhand.		Meerut.		Sirhind.		Lahore.		Rawal Pindi.		Peshawar.		Madras.		Southern District.		Bangalore.	
2,385		4,321		4,074		5,077		6,393		2,893		1,115		1,394		1,951	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
8	1	8	—	9	2	14	—	10	—	2	—	—	—	—	—	17	2
2	—	—	—	3	—	2	—	3	—	1	—	—	—	—	—	9	—
79	22	85	22	218	43	86	22	66	23	109	27	7	2	37	16	47	16
72	—	22	—	76	—	359	—	53	—	1	—	52	—	18	—	79	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12	10	3	2	—	—	1	1	2	2	—	—	—	—	—	—	4	4
53	—	96	2	86	—	59	4	70	2	38	1	73	—	21	—	65	—
1	—	5	—	40	—	60	5	15	1	13	—	3	—	45	—	1	—
227	33	219	26	432	45	581	32	219	28	164	28	135	2	121	16	222	22
727	—	1,263	3	906	1	1,241	1	1,632	6	1,396	5	99	—	216	—	101	—
3	—	3	—	15	4	8	1	18	1	7	—	—	—	4	—	2	—
482	—	646	—	614	—	508	—	935	—	135	—	148	—	187	—	351	—
290	—	396	1	389	—	405	1	386	—	161	—	157	—	163	1	158	—
829	—	759	—	755	—	967	—	810	—	310	—	244	—	227	—	331	—
1,601	—	1,801	1	1,758	—	1,880	1	2,161	—	606	—	549	—	577	1	870	—
—	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—	—	—
11	—	11	—	27	—	18	—	15	—	1	—	4	—	4	—	1	—
—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—
8	—	7	—	37	—	19	—	46	1	—	—	7	—	2	—	6	—
34	—	53	—	130	—	108	—	82	—	34	1	37	—	43	—	22	—
65	—	139	—	132	—	108	—	219	—	64	—	56	—	82	—	35	—
9	1	14	4	20	4	14	—	18	4	10	3	22	4	—	—	5	—
13	1	20	—	17	—	27	—	29	—	25	—	13	—	9	—	17	—
26	—	34	2	46	—	68	2	36	1	9	—	5	—	9	—	19	—
5	—	3	—	2	—	8	—	7	—	—	—	4	—	1	—	4	—
34	—	45	—	56	—	53	—	57	—	27	—	27	—	20	—	31	—
48	—	87	—	69	—	76	—	86	—	60	—	37	—	23	—	9	—
32	2	28	2	51	1	16	2	44	2	17	—	9	2	13	—	15	1
85	2	134	4	128	4	198	3	231	9	138	5	28	—	33	—	36	—
329	3	500	10	746	11	627	2	673	4	281	2	140	4	235	—	180	—
98	—	147	—	91	—	137	—	176	—	38	—	29	—	56	—	85	—
2	1	10	1	9	—	5	—	10	2	2	—	3	1	8	—	4	—
167	—	587	—	214	—	535	—	123	—	299	—	87	—	54	—	49	—
25	—	51	—	66	—	31	—	85	—	23	—	7	—	21	—	15	—
64	—	105	—	131	—	124	—	155	—	64	—	19	—	43	—	41	—
178	—	312	—	318	—	408	—	273	—	238	—	131	—	56	—	88	—
—	1	3	—	—	—	4	1	1	—	2	—	—	—	—	—	1	—
15	5	16	3	8	1	72	12	22	9	31	4	1	—	3	—	2	—
214	4	379	2	551	2	463	4	789	3	237	1	121	1	210	—	217	2
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	—	14	—	10	—	8	—	25	—	3	—	1	—	12	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4,017	53	5,986	58	5,970	73	6,898	61	7,234	72	3,776	49	1,571	14	1,855	17	2,078	25

ABSTRACT No. XV.—TABLE, taken from the REPORT of the PRINCIPAL CLASSES of DISEASES in each of the MILITARY DISTRICTS in INDIA,

Military Districts.	Belgaum.		Secunderabad.		Rangoon.		Mandalay.		Poona.	
Average Strength	1,855		2,941		2,248		1,925		3,925	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I.—GENERAL DISEASES.										
GROUP "A."										
Sub-Group I. Small-pox	—	—	1	—	1	—	—	—	3	—
Other Eruptive Fevers	—	—	—	—	—	—	1	—	3	—
Enteric Fever	11	2	96	18	17	2	12	1	90	32
Other Continued Fevers	—	—	41	—	181	—	270	—	42	—
Yellow Fever	—	—	—	—	—	—	—	—	—	—
Cholera	—	—	—	—	1	1	1	1	14	14
Dysentery	38	2	137	1	82	3	64	2	77	5
Other Diseases	3	—	83	—	168	—	5	—	—	—
Total	52	4	358	19	450	6	353	4	229	51
Sub-Group II.—Malarial Fevers	228	—	336	—	294	—	310	—	1,307	—
Sub-Group III.—Septic Diseases	2	—	—	—	1	—	1	—	2	1
Sub-Group IV. Syphilis, Primary	559	—	763	—	532	—	400	—	413	—
„ Secondary	236	1	312	1	229	—	190	—	447	1
Gonorrhœa	270	—	576	—	527	1	301	—	667	—
Total	1,065	1	1,651	1	1,288	1	891	—	1,527	1
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—	—	—	—
GROUP "B."										
Sub-Group I.—Parasitic Diseases	1	—	2	—	4	—	17	—	7	—
Sub-Group II. Scurvy	—	—	1	—	1	—	—	—	1	—
Alcoholism	7	—	16	—	12	—	3	—	7	—
GROUP "C."										
Debility, &c.	16	—	51	—	33	—	30	—	52	—
GROUP "D."										
Rheumatism	81	—	59	—	70	—	64	1	81	—
Tubercular Diseases	14	—	48	1	5	1	9	1	10	1
Other Diseases	22	2	26	—	43	—	18	—	26	—
II.—LOCAL DISEASES.										
Diseases of the—										
1. Nervous System Nervous Diseases	28	—	27	1	19	—	17	1	23	1
Mental „	—	—	—	—	5	—	2	—	3	1
2. Eye	29	—	36	—	11	—	49	—	34	—
3 & 4. Other Organs of Special Sense	29	—	16	—	31	—	34	—	48	—
5. Circulatory System	11	—	12	—	20	1	18	1	10	3
6. Respiratory „	33	1	126	1	75	1	43	—	86	3
7. Digestive „	134	3	305	—	279	3	299	2	407	6
8. Lymphatic and Glandular System	105	—	119	—	63	—	60	—	80	—
9. Urinary System	4	—	6	—	11	1	5	1	14	2
10. Generative „	26	—	48	—	44	—	92	—	358	—
11. Organs of Locomotion	27	—	40	—	28	—	11	—	35	—
12. Connective Tissues	53	—	96	—	61	—	50	—	64	—
13. Skin	82	—	120	—	234	—	287	—	169	—
III.—POISONS	1	—	—	—	—	—	1	—	8	—
IV.—INJURIES.										
1. General	1	—	16	5	2	1	10	1	3	1
2. Local	221	3	342	1	261	1	302	2	249	2
3. In Action	—	—	—	—	—	—	—	—	—	—
No appreciable disease	11	—	7	—	4	—	5	—	6	—
Cause unknown (refers to deaths only)	—	—	—	1	—	—	—	—	—	—
General Total	2,283	14	3,864	30	3,349	16	2,971	14	4,837	73

Medical Officer, showing the **Prevalence** and **Mortality** of the **Different** with the ratios per 1,000 of Strength, during the year 1896—*continued.*

Mhow.		Bombay.		Deesa.		Aden.		Sind.		Nagpur.		Quetta.		Marching.		Total.	
3,014		2,163		604		1,026		1,486		1,046		2,315		1,172		70,484	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
8	1	2	—	2	1	—	—	1	—	—	—	3	1	2	—	122	10
3	—	1	—	1	—	3	1	2	—	—	—	3	1	—	—	82	2
108	27	28	7	3	1	4	2	15	3	12	6	140	22	25	—	1,795	445
36	--	115	—	4	—	5	—	—	—	10	—	19	—	17	—	2,112	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	--
4	4	1	2	1	1	—	—	—	—	--	—	—	—	7	8	70	63
45	2	62	4	4	1	25	—	29	1	24	—	34	—	29	—	1,841	47
18	1	—	—	—	—	—	—	—	—	--	—	—	—	2	—	822	8
222	35	209	13	15	4	37	3	47	4	46	6	199	24	82	8	6,844	575
1,161	1	460	—	500	2	267	1	1,111	—	237	1	475	2	121	—	17,826	35
4	1	—	—	3	—	--	—	2	1	—	—	21	—	2	—	112	12
828	—	193	—	37	—	64	—	81	—	35	—	326	—	172	—	11,228	—
337	1	328	—	110	—	103	—	104	—	46	—	208	—	62	—	6,888	13
633	--	338	—	178	—	156	—	289	—	199	—	379	—	128	--	13,209	1
1,798	1	859	—	325	—	323	—	474	—	280	--	913	--	362	—	31,325	14
—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	3	3
9	—	—	—	6	—	1	—	5	—	—	—	7	—	—	—	193	—
1	—	—	--	5	—	1	—	—	—	—	—	—	—	—	—	18	—
11	1	10	—	12	—	12	—	1	—	7	—	8	—	—	--	293	4
56	—	86	—	46	—	21	—	20	—	—	—	8	—	4	—	1,205	1
189	—	78	—	20	—	21	—	78	—	13	—	73	—	32	—	2,198	1
8	2	69	6	5	1	2	—	2	—	1	2	5	1	—	—	354	51
14	—	30	—	5	1	6	—	15	1	—	—	33	—	2	—	482	5
30	—	45	—	9	1	1	—	13	—	3	—	10	1	3	—	577	14
2	—	11	—	—	—	—	—	1	—	5	—	6	—	—	—	93	1
33	—	34	—	6	—	10	—	27	—	4	—	14	—	4	—	786	—
55	—	52	—	10	—	16	—	96	—	7	—	29	—	3	—	1,157	—
13	—	113	4	1	1	11	—	35	1	3	—	13	—	2	—	692	33
146	4	76	1	35	3	15	—	22	—	13	1	63	3	51	1	2,209	55
393	2	297	4	90	—	118	1	172	3	57	1	373	2	75	1	8,494	105
115	—	78	—	22	1	16	—	54	—	28	--	45	—	33	—	2,187	1
4	—	9	1	1	1	4	—	3	1	—	—	8	—	1	—	154	13
315	—	263	—	133	—	103	—	306	—	317	—	283	—	78	—	5,555	—
33	—	35	—	7	—	10	—	11	—	12	—	28	—	20	—	788	1
78	—	84	—	18	—	27	—	34	—	24	—	74	—	18	—	1,759	—
188	—	108	—	76	—	114	—	227	—	45	—	82	—	22	—	4,820	1
—	—	—	—	—	—	5	--	—	—	—	—	—	—	—	—	34	8
8	2	9	—	7	2	4	1	16	3	—	—	—	—	1	2	288	70
309	1	247	—	127	2	127	2	167	—	48	—	294	—	86	1	7,129	39
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	—	1	—	1	—	2	—	2	—	7	—	5	—	—	—	164	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
5,197	50	3,263	29	1,485	19	1,274	8	2,041	14	1,157	11	3,066	34	1,002	13	97,738	1046

Ratios per 1,000

Military Districts.	Presidency.		Allahabad.		Oudh.		Rohilkhand.		Narbudda.	
Average Strength	2,984		2,493		4,999		3,369		1,316	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I.—GENERAL DISEASES.										
GROUP "A."										
Sub-Group I.										
Small-pox	—	—	8·4	—	1·8	—	·3	·59	—	—
Other Eruptive Fevers	1·3	—	11·2	—	·4	—	1·8	—	3·8	—
Enteric Fever	15·1	3·35	67·8	17·65	26·2	8·60	36·8	7·42	23·6	5·32
Other Continued Fevers	5·0	—	112·3	—	51·0	—	24·3	—	6·1	—
Yellow Fever	—	—	—	—	—	—	—	—	—	—
Cholera	1·0	1·01	5·6	3·21	—	—	—	—	1·5	1·52
Dysentery	58·0	1·68	44·9	·40	34·6	·60	27·0	·30	61·6	5·32
Other Diseases	—	—	2·8	—	49·6	—	31·2	·30	—	—
Total	80·4	6·03	253·1	21·26	163·6	9·20	121·4	8·61	96·5	12·16
Sub-Group II.—Malarial Fevers	231·2	2·68	152·8	·40	217·8	—	110·7	—	686·9	2·28
Sub-Group III.—Septic Diseases	—	—	1·2	·40	1·0	·20	1·5	·30	·8	—
Sub-Group IV.										
Syphilis, Primary	91·2	—	206·6	—	179·6	—	300·7	—	91·9	—
„ Secondary	102·9	—	70·6	—	105·0	·20	156·7	·59	79·8	2·28
Gonorrhœa	179·3	—	215·4	—	215·0	—	254·4	—	229·5	—
Total	373·3	—	492·6	—	499·7	·20	711·8	·59	401·2	2·28
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—	—	—	—
GROUP "B."										
Sub-Group I.—Parasitic Diseases	3·7	—	·4	—	4·4	—	1·8	—	1·6	—
Sub-Group II.										
Scurvy	—	—	·4	—	·4	—	—	—	1·6	—
Alcoholism	9·4	—	2·4	·40	2·4	—	2·4	·30	2·3	—
GROUP "C."										
Debility, &c.	24·1	—	14·4	—	11·4	—	13·7	—	22·8	—
GROUP "D."										
Rheumatism	18·3	—	28·9	—	23·0	—	37·4	—	11·4	—
Tubercular Diseases	3·7	·34	2·4	·80	3·4	1·20	6·2	1·19	6·8	1·52
Other Diseases	4·7	—	3·6	—	6·2	—	3·3	—	5·3	—
II.—LOCAL DISEASES.										
Diseases of the—										
1. Nervous System — Nervous Diseases	5·0	—	3·2	·80	7·2	·20	8·3	—	7·6	·76
1. Nervous System — Mental „	1·7	—	2·4	—	2·2	—	·6	—	—	—
2. Eye	8·0	—	6·0	—	9·4	—	11·9	—	12·9	—
3 & 4. Other Organs of Special Sense	13·1	—	12·8	—	22·4	—	9·5	—	16·0	—
5. Circulatory System	10·7	1·34	7·6	·80	13·8	1·20	23·4	·30	4·6	—
6. Respiratory „	17·8	·34	22·1	·40	25·6	·40	37·1	·59	40·3	2·28
7. Digestive „	120·0	3·69	121·5	1·20	97·6	3·40	143·7	1·19	114·7	4·56
8. Lymphatic and Glandular System	34·9	—	21·3	—	40·8	—	32·9	—	35·0	—
9. Urinary System	3·4	—	·8	—	1·0	·20	3·6	—	1·5	—
10. Generative „	104·6	—	93·9	—	23·2	—	22·3	—	263·7	—
11 Organs of Locomotion	12·1	—	14·0	—	8·6	·20	13·1	—	6·8	—
12 Connective Tissue	22·5	—	20·9	—	23·0	—	17·5	—	29·6	—
13 Skin	59·3	—	99·5	—	73·6	·20	58·5	—	64·6	—
III.—POISONS	·3	—	·8	·40	·6	·80	·3	—	·8	·76
IV.—INJURIES.										
1. General	1·7	1·68	4·0	1·20	4·0	1·40	1·5	·89	·8	—
2. Local	79·1	—	64·6	—	78·0	·80	70·9	·30	107·9	—
3. In Action	—	—	—	—	—	—	—	—	—	—
No appreciable disease	1·7	—	2·4	—	2·0	—	2·1	—	5·3	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—	—	—
General Total	1245·0	16·09	1450·1	28·08	1365·5	19·60	1467·2	14·25	1949·1	23·60

of Strength.

Bundelkhand.		Meerut.		Sirhind.		Lahore.		Rawal Pindi.		Peshawar.		Madras.		Southern District.		Bangalore.	
2,385		4,321		4,074		5,077		6,393		2,893		1,115		1,394		1,951	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
3·4	·42	1·9	—	2·2	·49	2·8	—	1·6	—	·7	—	—	—	—	—	8·7	1·03
·8	—	—	—	·7	—	·4	—	·5	—	·3	—	—	—	—	—	4·6	—
33·1	9·22	19·7	5·09	53·5	10·55	16·9	4·33	10·3	3·60	37·7	9·33	6·3	1·79	26·5	11·48	24·1	8·20
30·2	—	5·1	—	18·7	—	70·7	—	8·3	—	·3	—	46·6	—	12·9	—	40·5	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5·0	4·19	·7	·46	—	—	·2	·20	·3	·31	—	—	—	—	—	—	2·1	2·05
22·2	—	22·2	·46	21·1	—	11·6	·79	10·9	·31	13·1	·85	65·5	—	15·1	—	33·3	—
·4	—	1·2	—	9·8	—	11·8	·98	2·3	·16	4·5	—	2·7	—	32·3	—	·5	—
95·2	13·84	50·7	6·02	106·0	11·05	114·4	6·30	34·3	4·38	56·7	9·68	121·1	1·79	86·8	11·48	113·8	11·28
304·8	—	292·3	·69	222·4	·25	244·4	·20	235·3	·94	482·5	1·73	88·8	—	154·9	—	51·8	--
1·3	—	·7	—	3·7	·98	1·6	·20	2·8	·16	2·4	—	—	—	2·9	—	1·0	—
202·1	—	149·5	—	150·7	—	100·1	—	146·3	—	46·7	—	132·7	—	134·1	—	179·9	—
121·6	—	91·6	·23	95·5	—	79·8	·20	60·4	—	55·7	—	140·8	—	116·9	·72	96·4	—
347·6	—	175·7	—	185·3	—	190·5	—	131·4	—	107·2	—	218·8	—	162·8	—	169·7	—
671·3	—	416·8	·23	431·5	—	370·3	·20	338·0	—	209·5	—	492·4	—	413·9	·72	445·9	—
—	—	—	—	—	—	—	—	·3	·31	—	—	—	—	—	—	—	—
4·6	—	2·5	—	6·6	—	3·5	—	2·3	—	·3	—	3·6	—	2·9	—	·5	—
—	—	·2	—	—	—	·2	—	—	—	—	—	—	—	—	—	·5	—
3·4	—	1·6	—	9·1	—	3·7	—	7·2	·16	—	—	6·3	—	1·4	—	3·1	—
14·3	—	12·3	—	31·9	—	21·3	—	12·8	—	11·8	·35	33·2	—	30·8	—	11·3	—
27·3	—	32·2	—	32·4	—	33·1	—	34·3	—	22·1	—	50·2	—	58·8	—	17·9	—
3·8	·42	3·2	·93	4·9	·98	2·8	—	2·8	·63	3·5	1·04	19·7	3·59	—	—	2·7	—
5·5	·42	4·6	—	4·2	—	5·3	—	4·5	—	8·6	—	11·7	—	6·5	—	8·7	—
10·9	—	7·9	·46	11·3	—	13·4	·39	5·0	·16	3·1	—	4·5	—	6·5	—	9·7	—
2·1	—	·7	—	·5	—	1·6	—	1·1	—	—	—	3·6	—	·7	—	2·1	—
14·3	—	10·4	—	13·7	—	10·8	—	8·9	—	9·3	—	24·2	—	14·3	—	15·9	—
20·1	—	20·1	—	16·9	—	15·0	—	13·5	—	20·7	—	33·2	—	16·5	—	4·6	—
13·4	·84	6·5	·46	12·5	·25	3·2	·39	6·9	·31	5·9	—	8·1	1·79	9·3	—	7·7	·51
35·6	·84	31·0	·93	31·4	·98	39·0	·59	36·1	1·41	47·7	1·73	25·1	—	23·7	—	19·5	—
137·9	1·26	115·7	2·31	183·1	2·70	123·5	·39	105·3	·63	97·1	·69	123·6	3·59	168·6	—	93·3	—
38·6	—	34·0	—	22·3	—	27·0	—	27·5	—	13·1	—	26·0	—	40·2	—	43·6	—
·8	·42	2·3	·23	2·3	—	1·0	—	1·6	·31	·7	—	2·7	·90	5·7	—	2·1	—
70·0	—	135·8	—	52·5	—	103·4	—	19·2	—	103·4	—	78·0	—	38·7	—	25·1	—
10·5	—	11·8	—	16·2	—	6·1	—	13·3	—	8·0	—	6·3	—	15·1	—	7·7	—
26·8	—	24·3	—	32·2	—	21·4	—	24·2	—	22·1	—	17·0	—	30·8	—	21·0	—
74·6	—	72·2	—	78·1	—	80·0	—	42·7	—	82·3	—	117·5	—	40·2	—	45·1	—
—	·42	·7	—	—	—	·8	·20	·2	—	·7	—	—	—	—	—	·5	—
6·3	2·10	8·7	·69	2·0	·25	14·2	2·36	3·4	1·41	10·7	1·38	·9	—	2·2	—	1·0	—
89·7	1·68	87·7	·46	135·2	·49	91·2	·79	123·4	·47	81·9	·35	108·5	·90	150·6	—	111·2	1·03
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1·3	—	3·2	—	2·5	—	1·6	—	3·9	—	1·0	—	·9	--	8·6	—	—	--
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1684·3	22·22	1385·3	13·42	1465·4	17·92	1353·7	12·01	1131·5	11·26	1305·2	16·94	1409·0	12·56	1330·7	12·20	1066·1	12·81

Ratios per 1,000

Military Districts.	Belgaum.		Secunderabad.		Rangoon.		Mandalay.		Poona.	
Average Strength	1,855		2,941		2,248		1,925		3,925	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I.—GENERAL DISEASES.										
GROUP "A."										
Sub-Group I. Small-pox	—	—	·3	—	·4	—	·5	—	·8	—
Sub-Group I. Other Eruptive Fevers	—	—	—	—	—	—	—	—	·8	—
Sub-Group I. Enteric Fever	5·9	1·08	32·6	6·12	7·6	·89	6·2	·52	22·9	8·15
Sub-Group I. Other Continued Fevers	—	—	13·9	—	80·5	—	140·3	—	10·7	—
Sub-Group I. Yellow Fever	—	—	—	—	—	—	—	—	—	—
Sub-Group I. Cholera	—	—	—	—	·4	·44	·5	·52	3·6	3·57
Sub-Group I. Dysentery	20·5	1·08	46·6	·34	36·5	1·33	33·2	1·04	19·6	1·27
Sub-Group I. Other Diseases	1·6	—	28·2	—	74·7	—	2·6	—	—	—
Total	28·0	2·16	121·7	6·46	200·2	2·67	183·4	2·08	58·3	12·99
Sub-Group II.—Malarial Fevers	122·9	—	114·2	—	130·8	—	161·0	—	333·0	—
Sub-Group III.—Septic Diseases	1·1	—	—	—	·4	—	·5	—	·5	·25
Sub-Group IV. Syphilis, Primary	301·3	—	239·4	—	236·7	—	207·8	—	105·2	—
Sub-Group IV. „ Secondary	127·2	·54	106·1	·34	101·9	—	98·7	—	113·9	·25
Sub-Group IV. Gonorrhœa	145·6	—	195·9	—	234·4	·44	156·4	—	169·9	—
Total	574·1	·54	561·4	·34	573·0	·44	462·9	—	389·0	·25
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—	—	—	—
GROUP "B."										
Sub-Group I.—Parasitic Diseases	·5	—	·7	—	1·8	—	8·8	—	1·8	—
Sub-Group II. Scurvy	—	—	·3	—	·4	—	—	—	·3	—
Sub-Group II. Alcoholism	3·8	—	5·4	—	5·3	—	1·6	—	1·8	—
GROUP "C."										
Debility, &c.	8·6	—	17·3	—	14·7	—	15·6	—	13·2	—
GROUP "D."										
Rheumatism	43·7	—	20·1	—	31·1	—	33·2	·52	20·6	—
Tubercular Diseases	7·5	—	16·3	·34	2·2	·44	4·7	·52	2·5	·25
Other Diseases	11·9	1·08	8·8	—	19·1	—	9·4	—	6·6	—
II.—LOCAL DISEASES.										
Diseases of the—										
1. Nervous System, Nervous Diseases	15·1	—	9·2	·34	8·5	—	8·8	·52	5·9	·25
1. Nervous System, Mental „	—	—	—	—	2·2	—	1·0	—	·8	·25
2. Eye	15·6	—	12·2	—	4·9	—	25·5	—	8·7	—
3 & 4. Other Organs of Special Sense	15·6	—	5·4	—	13·8	—	17·7	—	12·2	—
5. Circulatory System	5·9	—	4·1	—	8·9	·44	9·4	·52	2·5	·76
6. Respiratory „	17·8	·54	42·8	·34	33·4	·44	22·3	—	21·9	·76
7. Digestive „	72·2	1·62	103·7	—	124·1	1·33	155·3	1·04	103·7	1·53
8. Lymphatic and Glandular System	56·6	—	40·5	—	28·0	—	31·2	—	20·4	—
9. Urinary System	2·2	—	2·0	—	4·9	·44	2·6	·52	3·6	·51
10. Generative „	14·0	—	16·3	—	19·6	—	42·6	—	91·2	—
11. Organs of Locomotion	14·6	—	13·6	—	12·5	—	5·7	—	8·9	—
12. Connective Tissue	28·6	—	32·6	—	27·1	—	26·0	—	16·3	—
13. Skin	44·2	—	40·8	—	104·1	—	149·1	—	40·8	—
III.—POISONS	·5	—	—	—	—	—	·5	—	2·0	—
IV.—INJURIES.										
1. General	·5	—	5·4	1·70	·9	·44	5·2	·52	·8	·25
2. Local	119·1	1·62	116·3	·34	116·1	·44	156·9	1·04	63·4	·51
3. In Action	—	—	—	—	—	—	—	—	—	—
No appreciable disease	5·9	—	2·4	—	1·8	—	2·6	—	1·5	—
Cause unknown (refers to deaths only)	—	—	—	·34	—	—	—	—	—	—
General Total	1230·7	7·55	1313·8	10·20	1489·8	7·12	1543·4	7·27	1232·4	18·60

of Strength—*continued.*

Mhow.		Bombay.		Deesa.		Aden.		Sind.		Nagpur.		Quetta.		Marching.		Total.	
3,014		2,163		604		1,026		1,486		1,046		2,315		1,172		70,484	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
2·7	·33	·9	—	3·3	1·66	—	—	·7	—	—	—	1·3	·43	1·7	—	1·7	·14
1·0	—	·5	—	1·7	—	2·9	—	1·3	—	—	—	1·3	·43	—	—	1·2	·03
35·8	8·96	12·9	3·24	5·0	1·66	3·9	·97	10·1	2·02	11·5	5·74	60·5	9·50	21·3	—	25·5	6·31
11·9	—	53·2	—	6·6	—	4·9	1·95	—	—	9·6	—	8·2	—	14·5	—	30·0	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1·3	1·33	·5	·92	1·7	1·66	—	—	—	—	—	—	—	—	6·0	6·83	1·0	·89
14·9	·66	28·7	1·85	6·6	1·66	24·4	—	19·5	·67	22·9	—	14·7	—	24·7	—	26·1	·67
6·0	·33	—	—	—	—	—	—	—	—	—	—	—	—	1·7	—	11·7	·11
73·7	11·61	96·6	6·01	24·8	6·62	36·1	2·92	31·6	2·69	44·0	5·74	86·0	10·37	70·0	6·83	97·1	8·16
385·2	·33	212·7	—	827·8	3·31	260·2	·97	747·6	—	226·6	·96	205·2	·86	103·2	—	252·9	·50
1·3	·33	—	—	5·0	—	—	—	1·3	·67	—	—	9·1	—	1·7	—	1·6	·17
274·7	—	89·2	—	61·3	—	62·4	—	54·5	—	33·5	—	140·8	—	146·8	—	159·3	—
111·8	·33	151·6	—	182·1	—	100·4	—	70·0	—	44·0	—	89·8	—	52·9	—	97·7	·18
210·0	—	156·3	—	294·7	—	152·0	—	194·5	—	190·2	—	163·7	—	109·2	—	187·4	·01
596·5	·33	397·1	—	538·1	—	314·8	—	319·0	—	267·7	—	394·4	—	308·9	—	444·4	·20
—	—	—	—	—	—	—	—	—	—	—	—	·4	·43	—	—	—	·04
3·0	—	—	—	9·9	—	1·0	—	3·4	—	—	—	3·0	—	—	—	2·7	—
·3	—	—	—	8·3	—	1·0	—	—	—	—	—	—	—	—	—	·3	—
3·6	·33	4·6	—	19·9	—	11·7	—	·7	—	6·7	—	2·6	—	—	—	4·2	·06
18·6	—	30·8	—	76·2	—	20·5	—	13·5	—	—	—	2·6	—	3·4	—	17·1	·01
62·7	—	35·1	—	33·1	—	20·5	—	52·5	—	12·4	—	31·5	—	27·3	—	31·2	·01
2·7	·66	31·9	2·77	8·3	1·66	1·9	—	1·3	—	1·0	1·91	2·2	·43	—	—	5·0	·72
4·6	—	13·9	—	8·3	1·66	5·8	—	10·1	·67	—	—	14·3	—	1·7	—	6·9	·07
10·0	—	20·3	—	14·9	1·66	1·0	—	8·7	—	2·9	—	4·3	·43	2·6	—	8·2	·20
·7	—	5·1	—	—	—	—	—	·7	—	4·6	—	2·6	—	—	—	1·3	·01
10·9	—	15·7	—	9·9	—	9·7	—	18·2	—	3·8	—	6·0	—	3·4	—	11·2	—
18·2	—	24·0	—	16·6	—	15·6	—	64·6	—	6·7	—	12·5	—	2·6	—	16·4	—
4·4	—	52·2	1·85	1·7	1·66	10·7	—	23·6	·67	2·9	—	5·6	—	1·7	—	9·8	·51
48·4	1·33	35·1	·46	57·9	4·97	14·6	—	14·8	—	12·4	·96	27·2	1·30	43·5	·85	31·3	·78
130·4	·66	137·3	1·85	149·0	—	115·0	·97	115·7	2·02	54·5	·96	161·1	·86	64·0	·85	120·5	1·49
38·2	—	36·1	—	36·4	1·66	15·6	—	36·3	—	26·8	—	19·4	—	28·2	—	31·0	·01
1·3	—	4·2	·46	1·7	1·66	3·9	—	2·0	·67	—	—	3·5	—	·9	—	2·2	·18
104·5	—	121·6	—	220·2	—	100·4	—	205·9	—	303·1	—	122·2	—	60·6	—	78·8	—
10·9	—	16·2	—	11·6	—	9·7	—	7·4	—	11·5	—	12·1	—	17·1	—	11·2	·01
25·9	—	33·8	—	29·8	—	26·3	—	22·9	—	22·9	—	32·0	—	13·4	—	25·0	—
62·4	—	49·9	—	125·8	—	111·1	—	152·8	—	43·0	—	35·4	—	18·8	—	68·4	·01
—	—	—	—	—	—	4·9	—	—	—	—	—	—	—	—	—	·5	·11
2·7	·66	4·2	—	11·6	3·31	3·9	·97	10·8	2·02	—	—	—	—	·9	1·71	4·1	·99
102·5	·33	114·2	—	210·3	3·31	123·8	1·95	112·4	—	45·9	—	127·0	—	73·4	·85	101·1	·55
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
·7	—	·5	—	1·7	—	1·9	—	1·3	—	6·7	—	2·2	—	—	—	2·3	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	·01
1724·3	16·39	1508·6	13·41	2458·0	31·46	1241·7	7·80	1979·1	9·42	1106·1	10·53	1324·4	14·69	854·9	11·09	1386·7	14·84

ABSTRACT No. XVI.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the ADMISSIONS and DEATHS which took place at the CHIEF STATIONS in INDIA during the year 1896.

Districts.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in and out of Hospital.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1886 to 1895.	
					Admissions.	Deaths.	Admissions.	Deaths.
PRESIDENCY	Fort William	1,049	1,473	17	1404·2	16·21	1444·5	11·61
	Fort Fulta	31	33	—	1064·5	—	*888·9	—
	Fort Chingrikhal	42	46	1	1095·2	23·81	†1488·1	—
	Dum-Dum	981	937	15	955·1	15·29	1674·4	16·86
	Barrackpore	358	715	9	1997·2	25·14	2051·1	18·39
	Darjeeling	523	511	6	977·1	11·47	1129·2	15·08
ALLAHABAD	Allahabad	1,037	1,370	39	1321·1	37·61	1730·3	20·36
	Fort Allahabad	213	400	5	1877·9	23·47	1591·0	17·46
	Dinapore	806	1,114	7	1382·1	8·68	1725·2	18·86
	Benares	437	731	19	1672·8	43·48	1711·4	21·60
OUDH	Lucknow	2,465	3,327	51	1349·7	20·69	1345·9	20·28
	" Military Prison	33	14	—	424·2	—	1360·0	8·89
	Fyzabad	1,003	1,511	24	1506·5	23·93	1492·2	12·19
	Sitapur	416	537	5	1290·9	12·02	1338·3	11·80
	Fatehgarh	215	244	2	1134·9	9·30	1466·5	17·11
	Cawnpore	867	1,193	16	1376·0	18·45	1564·1	22·59
ROHILKHAND	Bareilly	1,412	2,067	22	1463·9	15·58	1350·4	16·32
	Shahjahanpur	453	730	3	1611·5	6·62	1657·2	14·96
	Ranikhet	1,040	1,563	17	1502·9	16·35	1206·9	12·93
	Chaubuttia	329	427	2	1297·9	6·08	1324·3	12·93
	Naini Tal	135	156	4	1155·6	29·63	1551·7	20·58
NARBUDDA	Jubbulpore	845	1,575	19	1863·9	22·49	1538·5	17·90
	Saugor	358	734	8	2050·3	22·35	1930·1	10·90
	Pachmarhi	113	256	8	2265·5	70·80	1747·4	19·07

* 7 years (1889-95).

† 5 years (1891-95).

Districts.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in and out of Hospital.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1886 to 1895.	
					Admissions.	Deaths.	Admissions.	Deaths.
BUNDELKHAND	Agra - - -	1,129	1,374	23	1217·0	20·37	1508·9	16·85
	Nowgong - -	314	722	4	2299·4	12·74	1997·0	11·44
	Jhansi - - -	942	1,921	23	2039·3	27·60	2016·2	22·83
MEERUT -	Meerut - - -	2,004	2,809	29	1401·7	14·47	1663·6	17·49
	Muttra - - -	552	767	7	1389·5	12·68	1647·0	15·54
	Delhi - - -	287	525	9	1829·3	31·36	2400·2	20·16
	Roorkee - - -	401	468	7	1167·1	17·46	1352·9	19·66
	Chakrata - -	913	1,259	5	1379·0	5·48	1178·2	12·69
	Landour - -	164	158	1	963·4	6·10	1482·8	21·83
SIRHIND -	Umballa - -	2,023	2,975	30	1470·6	14·83	1191·7	13·23
	Dagshai - -	785	1,090	14	1388·5	17·83	1110·8	13·00
	Solon - - -	209	279	1	1334·9	4·78	872·3	9·25
	Subathu - -	448	764	19	1705·4	42·41	1197·7	13·44
	Jutogh - - -	235	298	4	1268·1	17·02	1139·7	10·09
	Kasauli - - -	374	564	5	1508·0	13·37	1500·7	15·21
LAHORE -	Mian Mir - -	924	1,512	15	1636·4	16·23	2358·8	27·56
	Jullundur - -	874	875	6	1001·1	6·86	1466·2	16·98
	Ferozepore - -	1,083	1,652	11	1525·4	10·16	1809·8	15·62
	Fort Lahore - -	94	179	1	1904·3	10·64	2711·6	47·72
	Amritsar - -	223	304	3	1363·2	13·45	2329·3	19·42
	Multan - - -	1,051	1,586	15	1509·0	14·27	1572·5	13·02
	Dalhousie - -	828	790	10	954·1	12·08	1530·8	15·30
RAWAL PINDI	Rawal Pindi - -	2,797	3,489	46	1247·4	16·45	1451·1	17·25
	Sialkot - - -	1,383	1,264	14	914·0	10·12	1528·4	15·19
	Campbellpore -	265	242	3	913·2	11·32	1610·1	12·12
	Fort Attock - -	167	201	—	1203·6	—	2280·4	26·74
	Khyra Gali - -	67	79	1	1179·1	14·93	1100·0	6·35
	Bara Gali - -	51	43	—	843·1	—	*1163·4	9·76
	Kuldana - -	484	540	1	1115·7	2·07	1200·3	6·48
	Kalabagh - -	50	50	—	1000·0	—	1166·0	9·88
	Camp Gharial -	450	550	3	1222·2	6·67	904·0	12·45
	„ Thobba -	314	522	—	1662·4	—	1220·8	9·08
	„ Topa - -	130	113	1	869·2	7·69	1086·9	7·85
	„ Ghora Dhaka	154	119	—	772·7	—	†736·1	6·31
	Murree - - -	81	22	3	271·6	37·04	1365·8	43·21

* 9 years (1886–90 and 1892–95).

† 5 years (1889–90, 1892, and 1894–95).

Districts.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in and out of Hospital.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Streugth, 1886 to 1895.	
					Admissions.	Deaths.	Admissions.	Deaths.
PESHAWAR	Peshawar	1,586	2,304	29	1452·7	18·28	1785·9	24·91
	Nowshera	714	1,243	12	1740·9	16·81	1612·0	17·35
	Cherat	593	229	8	386·2	13·49	1173·9	18·12
MADRAS	Madras	556	869	7	1562·9	12·59	1482·5	17·73
	St. Thomas' Mount	321	369	3	1149·5	9·35	1495·0	12·34
	Pallaveram	61	77	—	1262·3	—	1128·0	8·83
	Poonamallee	177	256	4	1446·3	22·60	2242·2	45·16
SOUTHERN DISTRICT.	Wellington	1,049	1,454	2	1386·1	1·91	1179·9	7·59
	Cannanore	96	92	5	958·3	52·08	1343·0	8·21
	Calicut	101	125	2	1250·0	20·00	1259·3	12·72
	Malapuram	148	184	8	1243·2	54·05	1382·3	11·84
BANGALORE	Bangalore	1,951	2,078	25	1065·1	12·81	1066·7	7·75
BELGAUM	Belgaum	1,160	1,351	9	1164·7	7·76	1036·4	4·97
	Bellary	671	912	5	1359·2	7·45	1403·2	8·30
	Ramandroog	24	20	—	833·3	—	*924·3	—
SECUNDERABAD	Secunderabad	2,941	3,864	30	1313·8	10·20	1162·1	12·98
RANGOON	Rangoon	1,167	1,789	13	1533·0	11·14	1414·5	16·41
	Port Blair	143	135	2	944·1	13·99	1043·9	7·79
	Thayetmyo	541	920	1	1700·6	1·85	1568·8	14·20
	Meiktila	397	505	—	1272·0	—	1630·2	12·04
MANDALAY	Mandalay	1,027	1,554	9	1513·1	8·76	†1754·0	18·87
	Shwebo	472	752	1	1593·2	2·12	†1597·2	10·36
	Bhamo	241	538	4	2232·4	16·60	†2240·7	21·24
	Bernardmyo	185	127	—	686·5	—	†1162·7	15·67
POONA	Poona	2,067	2,562	39	1239·5	18·87	1209·6	10·47
	Ahmednagar	770	870	5	1129·9	6·49	1274·2	12·27
	Kirkee	731	976	25	1335·2	34·20	1153·0	9·14
	Satara	239	291	3	1217·6	12·55	1471·7	4·55
	Purandhur	118	138	1	1169·5	8·47	1563·7	11·44
MHOW	Mhow	1,782	2,764	19	1551·1	10·66	1488·5	13·00
	Nasirabad	765	1,438	18	1879·7	23·53	1544·0	18·27
	Neemuch	327	803	7	2455·7	21·41	1744·4	22·94
	Indore	98	141	6	1438·8	61·22	1756·3	15·81
	Taragarh	42	51	—	1214·3	—	1833·8	37·25

* 7 years (1886 and 1890–95). † years (1838–93).

Districts.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in and out of Hospital.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1886 to 1895.	
					Admissions.	Deaths.	Admissions.	Deaths.
BOMBAY	Bombay	1,212	1,327	13	1094·9	10·73	1419·8	10·99
	Deolali	860	1,843	13	2143·0	15·12	1542·4	13·27
	Khandalla	91	93	3	1022·0	32·97	*1251·1	4·46
DEESA	Deesa	302	595	6	1970·2	19·87	1347·7	9·50
	Ahmedabad	230	786	11	3417·4	47·83	2267·5	22·22
	Mount Abu	72	104	2	1444·4	27·78	2102·4	11·81
ADEN	Aden	1,026	1,274	8	1241·7	7·80	1579·1	14·07
SIND	Karachi	1,105	2,273	10	2057·0	9·05	1753·2	12·47
	Hyderabad	381	668	4	1753·3	10·50	1633·5	8·20
NAGPUR	Kamptee	995	1,038	11	1043·2	11·06	1411·5	10·42
	Sitabaldi	51	119	—	2333·3	—	1648·4	13·23
QUETTA	Quetta	2,315	3,066	34	1324·4	14·69	1557·4	12·62
MARCHING	Troops on the march.	1,172	1,002	13	854·9	11·09	873·5	12·17

* 9 years (1887-95)

ABSTRACT No. XVII.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the STATIONS in INDIA at which the ADMISSIONS and DEATHS from ENTERIC FEVER took place in each of the four quarters of the year 1896.

Districts.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Presidency	Fort William	3	—	4	3	2	1	1	—	10	4
	„ Fulta	—	—	—	—	—	—	—	—	—	—
	„ Chingrikhal	—	—	—	—	—	—	—	—	—	—
	Dum-Dum	2	1	1	—	4	3	3	—	10	4
	Barrackpore	2	—	12	2	10	—	1	—	25	2
	Darjeeling	—	—	—	—	—	—	—	—	—	—
Allahabad	Allahabad	54	15	22	9	3	2	18	3	97	29
	Fort Allahabad	6	2	4	2	1	—	1	1	12	5
	Dinapore	1	—	3	—	1	—	1	1	6	1
	Benares	5	—	21	5	20	3	8	1	54	9
Oudh	Lucknow	8	3	23	9	8	4	18	5	57	21
	„ Military Prison.	—	—	—	—	—	—	—	—	—	—
	Fyzabad	7	3	6	2	12	4	14	4	39	13
	Sitapur	2	1	3	1	—	—	—	—	5	2
	Fatehgarh	9	2	—	—	1	—	—	—	10	2
	Cawnpore	9	2	3	2	4	1	4	—	20	5
Rohilkhand	Bareilly	16	6	9	2	13	3	8	2	46	13
	Shahjahanpur	1	—	—	—	—	—	—	—	1	—
	Ranikhet	25	6	28	2	19	3	3	—	75	11
	Chaubuttia	—	—	1	—	—	—	—	—	1	—
	Naini Tal	—	—	1	1	—	—	—	—	1	1
Narbudda	Jubbulpore	2	—	21	1	3	2	2	—	28	3
	Saugor	—	—	—	—	—	—	2	1	2	1
	Pachmarhi	—	2	1	1	—	—	—	—	1	3

Districts.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Bundelkhand	Agra	7	2	4	1	28	4	11	7	50	14
	Nowgong	1	—	—	—	—	—	—	—	1	—
	Jhansi	6	2	3	2	7	—	12	4	28	8
Meerut	Meerut	15	7	17	1	9	2	26	5	67	15
	Muttra	—	—	4	3	2	1	—	—	6	4
	Delhi	—	1	—	—	1	1	—	—	1	2
	Roorkee	1	—	1	—	—	—	1	—	3	—
	Chakrata	1	—	3	—	4	1	—	—	8	1
	Landour	—	—	—	—	—	—	—	—	—	—
Sirhind	Umballa	9	3	5	2	6	1	29	8	49	14
	Dagshai	—	—	12	3	28	8	1	—	41	11
	Solon	—	—	1	1	2	—	—	—	3	1
	Subathu	5	—	34	8	68	6	2	1	109	15
	Jutogh	1	—	5	1	4	1	—	—	10	2
	Kasauli	—	—	2	—	4	—	—	—	6	—
Lahore	Mian Mir	12	—	9	2	5	2	10	—	36	4
	Jullundur	1	—	6	2	—	—	3	1	10	3
	Ferozepore	—	—	3	1	1	—	3	1	7	2
	Fort Lahore	—	—	4	1	—	—	1	—	5	1
	Amritsar	—	—	1	—	2	1	1	1	4	2
	Multan	2	1	3	2	—	—	3	1	8	4
	Dalhousie	—	—	11	3	2	2	3	1	16	6
Rawal Pindi	Rawal Pindi	2	1	20	9	8	2	6	3	36	15
	Sialkot	1	—	7	1	2	—	6	1	16	2
	Campbellpore	—	—	2	1	1	1	1	—	4	2
	Fort Attock	—	—	—	—	—	—	—	—	—	—
	Khyra Gali	—	—	1	1	—	—	—	—	1	1
	Bara Gali	—	—	—	—	—	—	—	—	—	—

Districts.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Rawal Pindi —*cont.*	Kuldana -	—	—	1	1	1	—	—	—	2	1
	Kalabagh -	—	—	—	—	—	—	—	—	—	—
	Camp Gharial	—	—	3	1	—	—	—	—	3	1
	„ Thobba	—	—	2	—	—	—	—	—	2	—
	„ Topa -	—	—	2	—	—	—	—	—	2	—
	„ Ghora Dhaka.	—	—	—	—	—	—	—	—	—	—
	Murree -	—	—	—	1	—	—	—	—	—	1
Peshawar - -	Peshawar -	12	4	24	7	16	4	20	2	72	17
	Nowshera -	—	—	15	2	2	2	3	—	20	4
	Cherat - -	—	—	10	2	7	4	—	—	17	6
Madras -	Madras -	2	1	—	—	—	—	—	—	2	1
	St. Thomas' Mount.	1	—	1	1	—	—	1	—	3	1
	Pallaveram -	—	—	—	—	1	—	1	—	2	—
	Poonamallee -	—	—	—	—	—	—	—	—	—	—
Southern District - -	Wellington -	3	—	5	1	1	1	3	—	12	2
	Cannanore -	11	2	2	3	—	—	—	—	13	5
	Calicut -	—	—	—	—	3	1	2	1	5	2
	Malapuram -	—	1	3	2	4	4	—	—	7	7
Bangalore -	Bangalore -	11	1	16	9	10	4	10	2	47	16
Belgaum -	Belgaum -	2	—	1	—	2	—	3	1	8	1
	Bellary -	—	—	—	—	2	1	1	—	3	1
	Ramandroog	—	—	—	—	—	—	—	—	—	—
Secunderabad -	Secunderabad	13	2	8	3	54	10	21	3	96	18
Rangoon -	Rangoon -	2	—	3	—	8	2	3	—	16	2
	Port Blair -	—	—	—	—	—	—	1	—	1	—
	Thayetmyo -	—	—	—	—	—	—	—	—	—	—
	Meiktila -	—	—	—	—	—	—	—	—	—	—

Districts.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Mandalay -	Mandalay -	—	—	1	—	1	—	1	1	3	1
	Shwebo -	7	—	2	—	—	—	—	—	9	—
	Bhamo - -	—	—	—	—	—	—	—	—	—	—
	Bernardmyo -	—	—	—	—	—	—	—	—	—	—
Poona -	Poona - -	5	4	2	—	24	7	4	1	35	12
	Ahmednagar	5	—	2	1	3	1	3	—	13	2
	Kirkee - -	4	3	19	9	13	2	4	3	40	17
	Satara -	—	—	—	—	1	1	—	—	1	1
	Purandhur -	1	—	—	—	—	—	—	—	1	—
Mhow -	Mhow -	8	2	18	2	26	3	18	2	70	9
	Nasirabad -	2	—	16	8	9	2	2	2	29	12
	Neemuch -	1	—	2	2	1	1	1	—	5	3
	Indore - -	—	—	1	1	3	2	—	—	4	3
	Taragarh -	—	—	—	—	—	—	—	—	—	—
Bombay -	Bombay -	1	—	—	—	—	—	1	2	2	2
	Deolali -	10	2	3	1	4	—	9	2	26	5
	Khandalla -	—	—	—	—	—	—	—	—	—	—
Deesa -	Deesa - -	—	—	—	—	1	—	1	—	2	—
	Ahmedabad -	—	—	1	1	—	—	—	—	1	1
	Mount Abu -	—	—	—	—	—	—	—	—	—	—
Aden - -	Aden - -	—	—	—	—	3	2	1	—	4	2
Sind - -	Karachi -	3	1	2	—	4	—	—	—	9	1
	Hyderabad -	5	1	—	1	—	—	1	—	6	2
Nagpur -	Kamptee -	—	—	3	2	5	3	3	1	11	6
	Sitabuldi -	1	—	—	—	—	—	—	—	1	—
Quetta -	Quetta - -	—	—	36	4	73	16	31	2	140	22
Marching -	Troops on the March.	16	—	1	—	1	—	7	—	25	—
	Total -	342	84	526	152	568	132	359	77	1795	445

ABSTRACT No. XVIII.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the STATIONS in INDIA at which the ADMISSIONS and DEATHS from CHOLERA took place in each of the four quarters of the year 1896.

Districts.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Presidency -	Fort William	2	2	—	—	—	—	—	—	2	2
	Barrackpore -	—	—	1	1	—	—	—	—	1	1
Allahabad -	Dinapore -	—	—	—	—	2	1	—	—	2	1
	Benares -	6	4	—	—	—	—	—	—	6	4
	„ Sanitary Camp.	6	3	—	—	—	—	—	—	6	3
Narbudda -	Saugor - -	—	—	2	2	—	—	—	—	2	2
Bundelkhand	Nowgong -	—	—	—	—	2	1	—	—	2	1
	Jhansi - -	3	2	2	2	1	1	—	—	6	5
	„ Sanitary Camp.	—	—	4	4	—	—	—	—	4	4
Meerut -	Muttra - -	2	2	—	—	—	—	—	—	2	2
	Roorkee -	—	—	1	—	—	—	—	—	1	—
Lahore - -	Amritsar -	—	—	—	—	1	1	—	—	1	1
Rawal Pindi -	Rawal Pindi -	—	—	1	1	—	—	—	—	1	1
	Campbellpore	—	—	1	1	—	—	—	—	1	1
Bangalore -	Bangalore -	—	—	1	1	3	3	—	—	4	4
Rangoon -	Rangoon -	—	—	1	1	—	—	—	—	1	1
Mandalay -	Mandalay -	—	—	1	1	—	—	—	—	1	1
Poona - -	Poona - -	—	—	—	—	13	13	—	—	13	13
	Ahmednagar	—	—	—	—	1	1	—	—	1	1
Mhow - -	Mhow - -	2	2	—	—	—	—	—	—	2	2
	Indore - -	—	—	—	—	2	2	—	—	2	2
Bombay -	Bombay -	—	—	—	1	—	—	—	—	—	1
	Deolali - -	—	—	1	1	—	—	—	—	1	1
Deesa - -	Ahmedabad -	—	—	—	—	1	1	—	—	1	1
Marching -	Troops on the March.	7	8	—	—	—	—	—	—	7	8
	Total -	28	23	16	16	26	24	—	—	70	63

ABSTRACT No. XIX.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the PREVALENCE of DYSENTERY, DIARRHŒA, and HEPATIC DISEASES (Congestion, Inflammation, and Abscess of Liver) in each of the DISTRICTS in INDIA during the Year 1896.

Military Districts.	Strength.	Dysentery.				Diarrhœa.				Hepatic Diseases.				Total.			
		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Presidency - -	2,984	173	5	58·0	1·68	104	—	34·9	—	78	10	26·1	3·35	353	15	119·0	5·03
Allahabad - -	2,493	112	1	44·9	·40	52	—	20·9	—	57	2	22·9	·80	221	3	88·6	1·20
Oudh - - -	4,999	173	3	34·6	·60	75	—	15·0	—	126	15	25·2	3·00	374	18	74·8	3·60
Rohilkhand - -	3,369	91	1	27·0	·30	89	—	26·4	—	77	4	22·9	1·19	257	5	76·3	1·48
Narbudda - -	1,316	81	7	61·6	5·32	18	—	13·7	—	59	6	44·8	4·56	158	13	120·1	9·88
Bundelkhand - -	2,385	53	—	22·2	—	40	—	20·5	—	73	3	30·6	1·26	175	3	73·4	1·26
Meerut - - -	4,321	96	2	22·2	·46	92	1	21·3	·23	87	8	20·1	1·85	275	11	63·6	2·55
Sirhind - - -	4,074	86	—	21·1	—	150	—	36·8	—	98	10	24·1	2·45	334	10	82·0	2·45
Lahore - - -	5,077	59	4	11·6	·79	108	—	21·3	—	68	1	13·4	·20	235		46·3	·98
Rawal Pindi - -	6,393	70	2	10·9	·31	132	—	20·6	—	61	3	9·5	·47	263	5	41·1	·78
Peshawar - -	2,893	38	1	13·1	·35	45	—	15·6	—	27	2	9·3	·69	110	3	38·0	1·04
Madras - - -	1,115	73	—	65·5	—	5	—	4·5	—	75	4	67·3	3·59	153	4	137·2	3·59
Southern District -	1,394	21	—	15·1	—	21	—	15·1	—	18	—	12·9	—	60	—	43·0	—
Bangalore - -	1,951	65	—	33·3	—	16	—	8·2	—	59	—	30·2	—	140	—	71·8	—
Belgaum - -	1,855	38	2	20·5	1·08	—	—	—	—	16	3	8·6	1·62	54	5	29·1	2·70
Secunderabad - -	2,941	137	1	46·6	·34	25	—	8·5	—	101	—	34·3	—	263	1	89·4	·34
Rangoon - -	2,248	82	3	36·5	1·33	25	—	11·1	—	115	3	51·2	1·33	222	6	98·8	2·67
Mandalay - -	1,925	64	2	33·2	1·04	37	—	19·2	—	116	2	60·3	1·04	217	4	112·7	2·08
Poona - - -	3,925	77	5	19·6	1·27	92	—	23·4	—	80	6	20·4	1·53	249	11	63·4	2·80
Mhow - - -	3,014	45	2	14·9	·66	84	—	27·9	—	81	2	26·9	·66	210	4	69·7	1·33
Bombay - - -	2,163	62	4	28·7	1·85	60	—	27·7	—	60	—	27·7	—	182	4	84·1	1·85
Deesa - - -	604	4	1	6·6	1·66	16	—	26·5	—	19	—	31·5	—	39	1	64·6	1·66
Aden - - -	1,026	25	—	24·4	—	4	—	3·9	—	42	1	40·9	·97	71	1	69·2	·97
Sind - - -	1,486	29	1	19·5	·67	55	—	37·0	—	18	3	12·1	2·02	102	4	68·6	2·69
Nagpur - - -	1,046	24	—	22·9	—	4	—	3·8	—	21	1	20·1	·96	49	1	46·8	·96
Quetta - - -	2,315	34	—	14·7	—	49	—	21·2	—	16	1	6·9	·43	99	1	42·8	·43
Marching - -	1,172	29	—	24·7	—	12	—	10·2	—	10	—	8·5	—	51	—	43·5	—
Total - -	70,484	1,841	47	26·1	·67	1,419	1	20·1	·01	1,658	90	23·5	1·28	4,918	138	69·8	1·96

ABSTRACT No. XX.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the PREVALENCE and MORTALITY in the Cantonments of INDIA, due to DYSENTERY, DIARRHŒA, and HEPATIC DISEASES (Congestion, Inflammation, and Abscess of the Liver) in each Quarter of the Year 1896.

—		Dysentery.				Diarrhœa.				Hepatic Diseases.				Total.			
		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.	
	Strength.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1st Quarter -	70,184	400	7	5·7	·10	268	—	3·8	—	374	22	5·3	·31	1,042	29	14·8	·41
2nd " -	71,108	459	16	6·5	·23	392	—	5·5	—	428	21	6·0	·30	1,279	37	18·0	·52
3rd " -	70,492	536	15	7·6	·21	517	1	7·3	·01	493	25	7·0	·35	1,546	41	21·9	·58
4th " -	70,151	446	9	6·4	·13	242	—	3·4	—	363	22	5·2	·31	1,051	31	15·0	·44
Total -	70,484	1,841	47	26·1	·67	1,419	1	20·1	·01	1,658	90	23·5	1·28	4,918	138	69·8	1·96

ABSTRACTS XXI. to XXVI.

ABSTRACT No. XXI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the TROOPS stationed at EGYPT and CYPRUS during the Year 1896, with

Average Strength, 3,916.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
Diseases.		In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
I.—GENERAL DISEASES.							
GROUP "A."							
Sub-Group I. Small-pox	2	—	—	—	—	—	·28
Other Eruptive Fevers	10	—	—	—	—	—	·47
Enteric Fever	97	23	—	23	2	—	21·67
Other Continued Fevers	222	—	—	—	—	—	9·87
Yellow Fever	—	—	—	—	—	—	—
Cholera	6	6	—	6	—	—	·03
Dysentery	48	2	—	2	—	—	3·93
Other Diseases	6	—	—	—	—	—	·27
Total	391	31	—	31	2	—	36·52
Sub-Group II.—Malarial Fevers	26	—	—	—	—	—	·93
Sub-Group III.—Septic Diseases	1	—	—	—	—	—	·07
Sub-Group IV. Syphilis, Primary	312	—	—	—	—	—	27·40
„ Secondary	208	—	—	—	—	—	22·19
Gonorrhœa	417	—	—	—	—	—	26·36
Total	937	—	—	—	—	—	75·95
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—
GROUP "B."							
Sub-Group I.—Parasitic Diseases	11	—	—	—	—	—	·23
Sub-Group II. Scurvy	—	—	—	—	—	—	—
Alcoholism	8	1	—	1	—	—	·29
GROUP "C."							
Debility, &c.	76	—	—	—	3	2	8·07
GROUP "D."							
Rheumatism	95	—	—	—	1	1	6·55
Tubercular Diseases	16	6	—	6	5	4	6·82
Other Diseases	26	1	—	1	1	—	2·43
II.—LOCAL DISEASES.							
Diseases of the—							
1. Nervous System: Nervous Diseases	20	—	—	—	2	2	1·55
Mental „	1	—	—	—	—	3	·25
2. Eye	71	—	—	—	4	4	4·57
3 & 4. Other Organs of Special Sense	46	—	—	—	—	—	3·68
5. Circulatory System	28	—	—	—	7	7	4·10
6. Respiratory „	99	2	—	2	1	—	7·73
7. Digestive „	418	4	—	4	4	1	18·22
8. Lymphatic and Glandular System	60	—	—	—	—	—	8·11
9. Urinary System	3	—	—	—	1	—	·47
10. Generative „	367	—	—	—	1	1	28·48
11. Organs of Locomotion	30	—	—	—	1	1	2·55
12. Connective Tissue	69	—	—	—	—	—	3·76
13. Skin	142	—	—	—	1	1	9·23
III.—POISONS	4	—	—	—	—	—	·14
IV.—INJURIES.							
1. General	12	5	—	5	—	—	1·55
2. Local	243	2	—	2	2	2	14·30
3. In Action	—	—	—	—	—	—	—
No appreciable disease	20	—	—	—	—	—	·68
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	3,220	52	—	52	36	29	247·23

into Hospital, Deaths, Numbers Invalided and Constantly Sick among the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1886 to 1895.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
·5	—	—	—	·07	2·7	·32	—	—	·30
2·5	—	—	—	·12	1·7	—	—	—	·55
24·8	5·87	·51	—	5·54	32·3	8·39	6·93	·07	5·16
56·7	—	—	—	2·52	120·9	·06	1·30	·02	4·58
—	—	—	—	—	—	—	—	—	—
1·5	1·53	—	—	·01	—	—	—	—	—
12·3	·51	—	—	1·00	33·8	1·30	2·32	·21	2·55
1·5	—	—	—	·07	5·2	·02	—	—	·16
99·8	7·91	·51	—	9·33	196·6	10·09	10·55	·30	13·30
6·6	—	—	—	·24	24·9	·04	·24	·06	·09
·3	—	—	—	·02	1·4	·09	·04	—	·08
79·7	—	—	—	7·00	59·3	—	·08	—	4·99
53·1	—	—	—	5·66	39·1	—	1·00	·45	3·60
106·5	—	—	—	6·73	106·5	—	·11	·04	7·10
239·3	—	—	—	19·39	204·9	—	1·19	·49	15·69
—	—	—	—	—	—	—	—	—	—
2·8	—	—	—	·06	4·3	·02	—	—	·12
—	—	—	—	—	·1	—	·02	—	·01
2·0	·25	—	—	·07	4·6	·11	·04	—	·18
19·4	—	·77	·51	2·06	25·7	—	4·58	1·77	1·87
24·3	—	·25	·25	1·67	25·6	·15	1·02	·25	1·76
4·1	1·53	1·28	1·02	1·74	2·6	·59	1·62	1·30	·62
6·6	·25	·25	—	·62	9·6	·04	·34	·17	·68
5·1	—	·51	·51	·40	8·5	·43	1·23	·98	·57
·3	—	—	·77	·06	1·6	·04	1·51	1·70	·40
18·1	—	1·02	1·02	1·17	41·7	—	·74	·49	1·58
11·7	—	—	—	·94	14·2	·02	·55	·55	·79
7·2	—	1·79	1·79	1·05	10·6	·38	3·28	3·34	1·16
25·3	·51	·25	—	1·97	38·1	·91	1·04	·70	2·50
106·7	1·02	1·02	·25	4·65	142·0	1·30	2·19	·85	5·56
15·3	—	—	—	2·07	20·7	—	·36	·11	2·39
·8	—	·25	—	·12	1·9	·06	·23	·17	·19
93·7	—	·25	·25	7·27	103·5	—	·30	·30	7·27
7·7	—	·25	·25	·65	8·1	·02	·58	·57	·63
17·6	—	—	—	·96	26·6	—	·19	·04	1·30
36·3	—	·25	·25	2·36	53·9	—	·15	—	2·58
1·0	—	—	—	·04	·8	·11	—	—	·02
3·1	1·28	—	—	·40	2·0	1·28	·13	·04	·13
62·1	·51	·51	·51	3·65	92·1	·58	·94	·58	4·40
—	—	—	—	—	—	·04	·15	·11	·05
5·1	—	—	—	·17	3·1	—	—	—	·11
—	—	—	—	—	—	—	—	—	—
822·3	13·28	9·19	7·40	63·13	1,069·7	16·30	33·21	14·87	67·29

ABSTRACT No. XXII.—Table showing the Average Strength, Ship proceeding on and returning from Service Abroad, and from one during the Year 1896.

Strength of W.O., N.C.O., and Men:	Passage Out.		Passage Home.	
Embarked	19,163		14,336	
Average Annual Strength	1,131		953	
	Admitted.	Died.	Admitted.	Died.
I.—GENERAL DISEASES.				
Group "A."				
Sub-Group I. Small-pox	—	—	—	—
Sub-Group I. Other Eruptive Fevers	6	—	3	—
Sub-Group I. Enteric Fever	2	—	2	1
Sub-Group I. Other Continued Fevers	24	—	9	—
Sub-Group I. Yellow Fever	—	—	—	—
Sub-Group I. Cholera	—	—	—	—
Sub-Group I. Dysentery	—	—	10	1
Sub-Group I. Other Diseases	1	—	—	—
Total	33	—	24	2
Sub-Group II.—Malarial Fevers	3	—	353	3
Sub-Group III.—Septic Diseases	—	—	3	1
Sub-Group IV. Syphilis, Primary	130	—	82	—
Sub-Group IV. „ Secondary	38	—	57	—
Sub-Group IV. Gonorrhœa	328	—	178	—
Total	496	—	317	—
Sub-Group V.—Hydrophobia, &c.	—	—	—	—
Group B."				
Sub-Group I.—Parasitic Diseases	—	—	—	—
Sub-Group II. Scurvy	—	—	1	—
Sub-Group II. Alcoholism	3	—	—	—
Group "C."				
Debility, &c.	7	—	3	—
Group "D."				
Rheumatism	15	—	14	—
Tubercular Diseases	1	—	3	—
Other Diseases	18	—	2	—
II.—LOCAL DISEASES.				
Diseases of the—				
1. Nervous System, Nervous Diseases	10	—	3	—
1. Nervous System, Mental „	—	—	1	—
2. Eye	13	—	15	—
3 & 4. Other Organs of Special Sense	7	—	3	—
5. Circulatory System	5	—	—	—
6. Respiratory „	41	—	60	2
7. Digestive „	169	—	66	1
8. Lymphatic and Glandular System	20	—	23	—
9. Urinary System	2	—	—	—
10. Generative „	66	—	62	—
11. Organs of Locomotion	4	—	10	—
12. Connective Tissue	25	—	27	—
13. Skin	92	—	43	—
III.—POISONS	—	—	—	—
IV.—INJURIES.				
1. General	4	—	5	—
2. Local	79	1	37	—
3. In Action	—	—	—	—
No appreciable disease	1	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—
General Total	1,114	1	1,075	9

ADMISSIONS into HOSPITAL, and DEATHS among the TROOPS ON BOARD Colony or Station abroad to another, with the Ratios per 1,000 of the Strength

Intercolonial.		Ratio per 1,000 of the Strength.					
10,469 464		Passage Out.		Passage Home.		Intercolonial.	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
—	—	—	—	—	—	—	—
2	—	5·3	—	3·1	—	4·3	—
1	—	1·8	—	2·1	1·05	2·1	—
7	—	21·2	—	9·5	—	15·1	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	10·5	1·05	—	—
—	—	·9	—	—	—	—	—
10	—	29·2	—	25·2	2·10	21·5	—
62	1	2·7	—	370·4	3·15	133·6	2·15
—	—	—	—	3·1	1·05	—	—
21	—	114·9	—	86·0	—	45·3	—
13	—	33·6	—	59·8	—	28·0	—
160	—	290·0	—	186·8	—	344·8	—
194	—	438·5	—	332·6	—	418·1	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	1·1	—	—	—
—	—	2·7	—	—	—	—	—
6	—	6·2	—	3·1	—	12·9	—
7	—	13·3	—	14·7	—	15·1	—
—	—	·9	—	3·1	—	—	—
18	—	15·9	—	2·1	—	38·8	—
—	—	8·8	—	3·1	—	—	—
—	—	—	—	1·1	—	—	—
5	—	11·5	—	15·7	—	10·8	—
4	—	6·2	—	3·1	—	8·6	—
—	—	4·4	—	—	—	—	—
13	1	36·3	—	63·0	2·10	28·0	2·15
20	—	149·4	—	69·3	1·05	43·1	—
20	—	17·7	—	24·1	—	43·1	—
1	—	1·8	—	—	—	2·2	—
92	—	58·4	—	65·1	—	198·3	—
6	—	3·5	—	10·5	—	12·9	—
26	—	22·1	—	28·3	—	56·0	—
20	—	81·3	—	45·1	—	43·1	—
—	—	—	—	—	—	—	—
	—	3·5	—	5·3	—	2·2	—
21	—	69·8	·88	38·8	—	45·3	—
—	—	—	—	—	—	—	—
—	—	·9	—	—	—	—	—
—	—	—	—	—	—	—	—
526	2	985·0	·88	1128·0	9·44	1133·6	4·31

ABSTRACT No. XXIII.—ON THE INFLUENCE OF AGE ON THE MORTALITY.—Table showing the Death Rates of Warrant Officers, Non-commissioned Officers and Men, at the several Ages, arranged by quinquennial Periods, in the several Commands Abroad.

Commands.	Under 20 Years.				20 and under 25.				25 and under 30.				30 and under 35.				35 and under 40.				40 and upwards.			
	Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.	
			1896.	1886-95.			1896.	1886-95.			1896.	1886-95.			1896.	1886-95.			1896.	1886-95.			1896.	1886-95.
Gibraltar	312	1	3·21	1·89	2,370	8	3·37	4·15	1,549	5	3·23	3·63	268	1	3·73	5·20	94	2	21·28	7·72	37	—	—	23·19
Malta	1,087	7	6·44	5·90	4,914	42	8·55	6·98	1,747	8	4·58	5·02	398	2	5·02	6·56	132	2	15·15	10·75	38	1	26·32	24·21
Egypt and Cyprus	176	—	—	15·78	2,270	28	12·33	18·37	1,130	17	15·04	12·04	207	4	19·32	11·96	92	2	21·74	18·77	41	1	24·39	22·10
Canada	71	—	—	2·44	723	3	4·15	2·34	506	—	—	3·86	138	1	7·25	6·57	41	—	—	15·07	25	—	—	9·61
Bermuda	28	—	—	6·72	741	1	1·35	10·32	468	5	10·68	9·18	98	2	20·41	12·36	42	—	—	11·90	10	—	—	18·69
West Indies	24	—	—	2·16	564	4	7·09	9·56	536	3	5·60	9·95	113	—	—	12·21	43	—	—	18·07	13	1	76·92	16·30
South Africa and St. Helena	330	—	—	5·18	2,567	15	5·84	6·07	1,195	2	1·67	5·26	224	3	13·39	7·97	68	1	14·71	9·76	28	—	—	11·87
Mauritius	23	—	—	13·79	369	4	10·83	11·07	229	1	4·37	19·79	38	—	—	21·50	15	1	16·67	25·42	2	—	—	40·00
Ceylon	35	1	28·57	5·62	705	4	5·67	8·48	452	4	8·85	14·09	105	2	19·05	19·91	37	—	—	16·26	2	—	—	—
China	27	—	—	2·58	799	3	3·75	9·40	463	3	6·48	10·84	142	3	21·13	16·83	31	1	32·26	13·84	8	1	125·00	56·34
Straits Settlements	23	—	—	1·74	766	1	1·30	6·79	437	3	6·86	5·96	95	6	63·16	7·11	26	—	—	14·29	5	—	—	22·47
India	1,864	24	12·88	9·37	36,464	648	17·77	17·25	24,450	275	11·24	13·35	4,690	64	13·65	13·49	1,493	23	15·41	15·49	386	12	31·09	24·23

ABSTRACT No. XXIV.—TABLE showing the various CORPS which served in the UNITED KINGDOM during the Year 1896, and some of the most important of their HEALTH STATISTICS.

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
											days.	days.		
	HOUSEHOLD CAVALRY.													
1st	Life Guards - - - - -	407	226	—	21	14·09	555·3	—	51·60	34·42	12·60	22·69	London, 3 months; Windsor, 9 months	80
2nd	Life Guards - - - - -	408	232	—	7	11·16	568·6	—	17·16	27·35	10·01	17·60	London, 9 months; Windsor, 3 months	80
	Royal Horse Guards - - -	405	269	—	6	15·83	664·2	—	14·81	39·09	14·31	21·55	London, 12 months - - -	80
	Household Cavalry detached -	3	1	—	—	·14	333·3	—	—	46·67	17·08	51·24		—
	Total Household Cavalry -	1,223	728	—	34	41·22	595·3	—	27·80	33·70	12·33	20·72		
	CAVALRY.													
1st	Dragoon Guards - - -	374	381	1	9	19·66	1018·7	2·67	24·06	52·57	19·24	18·89	Colchester, 12 months - - -	5
2nd	Dragoon Guards - - -	49	12	—	—	1·14	245·0	—	—	23·26	8·51	34·73	Shorncliffe, 2 months. From Egypt -	—
3rd	Dragoon Guards - - -	397	263	1	5	15·83	762·5	2·52	12·59	38·06	13·93	36·27	Shorncliffe, 10 months; Woolwich, 2 months.	1
6th	Dragoon Guards - - -	422	346	1	8	15·72	819·9	2·37	18·96	37·25	13·63	16·62	Preston, 8 months; Aldershot, 4 months.	8
7th	Dragoon Guards - - -	408	260	2	7	14·26	637·2	4·90	17·16	34·95	12·79	20·07	Norwich, 12 months - - -	2
1st	Royal Dragoons - - -	604	310	2	11	20·46	513·2	3·31	18·21	33·87	12·40	24·17	Curragh, 2 months; Belfast, 5 months; Dublin, 5 months.	40
2nd	Royal Dragoons - - -	647	419	—	10	26·63	647·6	—	15·46	41·16	15·06	23·23	Aldershot, 9 months; Hounslow, 3 months.	40

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	CAVALRY—*cont.*										days.	days.		
3rd	Hussars - - - - -	654	262	1	7	19·25	400·6	1·53	10·70	29·43	10·77	26·89	Aldershot, 12 months - - -	17
4th	Hussars - - - - -	372	300	1	20	19·89	806·4	2·69	53·76	53·47	19·57	24·27	Hounslow, 9 months. To India -	—
6th	Dragoons - - - - -	382	354	1	8	20·84	926·7	2·62	20·94	54·55	19·96	20·46	Piershill, 12 months - - -	6
8th	Hussars - - - - -	394	330	—	2	21·10	837·6	—	5·08	53·55	19·60	23·40	Leeds and York, 12 months - -	7
9th	Lancers - - - - -	411	302	2	14	19·63	734·8	4·87	34·06	47·76	17·48	23·79	Aldershot, 9 months. To South Africa	—
10th	Hussars - - - - -	607	343	2	8	19·89	565·1	3·29	13·18	32·77	11·99	21·22	Newbridge, 12 months - - -	12
12th	Lancers - - - - -	411	249	5	9	9·97	605·8	12·16	21·90	24·26	8·88	14·65	Ballincollig, 12 months - - -	9
13th	Hussars - - - - -	545	578	2	23	33·36	1061·4	3·67	42·20	61·21	22·40	21·30	Dundalk and Belfast, 6 months; Dublin, 6 months.	11
14th	Hussars - - - - -	495	213	1	3	11·58	430·3	2·02	6·06	23·39	8·56	19·89	Cahir, 12 months - - -	10
15th	Hussars - - - - -	670	452	—	16	30·46	674·6	—	23·88	45·46	16·64	24·64	Dublin, 7 months; Aldershot, 5 months.	15
17th	Lancers - - - - -	425	182	2	4	12·46	428·2	4·70	9·41	29·31	10·73	25·05	York, 12 months - - - -	6
	Cavalry Depôt - - -	1,510	1,453	2	44	69·70	962·2	1·32	29·14	46·16	16·89	17·55	Canterbury - - - -	—
	Various Regiments - - -	193	79	—	5	10·19	409·3	—	25·91	52·80	19·32	47·23		
	Total Cavalry of the Line -	9,970	7,083	26	218	412·02	710·4	2·61	21·86	41·83	15·12	21·29		

	ROYAL ARTILLERY.													
Depôt	Horse Artillery	171	137	—	6	8·28	801·2	—	35·09	48·42	17·72	22·12	Woolwich, 12 months	Permanent.
D	Horse Artillery	160	69	—	2	5·56	431·2	—	12·50	34·75	12·72	29·51	London, 9 months; Woolwich, 3 months.	8
E	Horse Artillery	161	93	—	3	6·69	577·6	—	18·63	41·55	15·21	26·32	Aldershot, 12 months	7
G	Horse Artillery	164	88	1	1	5·53	536·6	6·10	6·10	33·72	12·34	23·00	Woolwich, 9 months; London, 3 months.	7
J	Horse Artillery	147	85	1	3	5·26	578·2	6·80	20·41	35·78	13·10	22·65	Aldershot, 12 months	10
O	Horse Artillery	158	95	—	2	9·11	601·3	—	12·66	57·66	21·10	35·10	Woolwich, 12 months	7
P	Horse Artillery	153	128	1	5	5·46	836·6	6·53	32·68	35·69	13·06	15·61	Aldershot, 10 months; Ipswich, 2 months.	5
Q	Horse Artillery	130	100	—	4	5·02	769·2	—	30·77	38·61	14·13	18·36	Newbridge, 12 months	1
R	Horse Artillery	147	107	—	1	4·96	727·9	—	6·80	33·74	12·35	16·97	Newbridge, 12 months	4
T	Horse Artillery	151	115	1	7	6·35	761·6	6·62	46·36	42·05	15·39	20·21	Dorchester, 5½ months; Aldershot, 6½ months.	3
U	Horse Artillery	158	95	—	1	7·66	601·3	—	6·33	48·48	17·74	29·51	Woolwich, 12 months	1
—	Riding Establishment	100	56	—	—	5·86	560·0	—	—	58·60	21·45	38·30	Woolwich, 12 months	Permanent.
Depôt	Field Artillery	453	498	6	10	39·92	1099·3	13·24	22·07	88·12	32·25	29·34	Woolwich, 12 months	"
1st	Field Battery	11	11	—	3	1·52	1000·0	—	272·73	138·18	50·57	50·57	Woolwich, ½ month. To India	—
2nd	Field Battery	12	3	—	—	·38	250·0	—	—	31·67	11·59	46·36	Shorncliffe, 2 months. From India	—
3rd	Field Battery	110	60	2	4	2·83	545·4	18·18	36·36	25·73	9·42	17·26	Aldershot, 9 months. To India	—
4th	Field Battery	132	108	—	4	7·43	818·2	—	30·30	56·29	20·60	25·18	Shorncliffe and Lydd, 12 months	6
7th	Field Battery	130	80	1	3	5·45	615·4	7·69	23·08	41·92	15·34	24·93	Newcastle-on-Tyne, 12 months	8
8th	Field Battery	12	12	—	—	·62	1000·0	—	—	51·67	18·91	18·91	Christchurch, 1 month. From India	—
11th	Field Battery	168	95	1	2	4·43	565·5	5·95	11·90	26·37	9·65	17·06	Clonmel and Limerick, 12 months	10
12th	Field Battery	160	76	—	—	5·00	472·0	—	—	31·25	11·44	24·24	Hilsea, 5½ months; Aldershot, 6½ months.	10
13th	Field Battery	166	129	1	5	6·03	777·1	6·02	30·12	36·32	13·29	17·10	Aldershot, 5 months; Dorchester, 7 months.	10

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
	[illegible]										days	days		
[illegible]	Field Battery	116	92		4	[illegible]	[illegible]		[illegible]	[illegible]	12·7[illegible]	[illegible]	Newcastle, 3 months; Ipswich, 9 months	8
[illegible]	Field Battery	[illegible]	4			·76	..						Aldershot, 1 month. To India	—
[illegible]	Field Battery	144	[illegible]	1	1	4·[illegible]	[illegible]	6·94	6·94	[illegible]	11·[illegible]	18·[illegible]	Exeter, 6 months; Okehampton, 1 month; Aldershot, 5 months.	9
19th	Field Battery	123	81		1	4·77	[illegible]		8·13	[illegible]	11·22	17·04	Christchurch, 7 months; Exeter and Okehampton 5 months.	3
24th	Field Battery	140	76	1	4	4·40	542·8	7·14	28·57	32·[illegible]	11·71	21·62	Shorncliffe and Lydd, 9 months; Ipswich, 3 months.	3
25th	Field Battery	150	104		1	4·44	693·3		6·67	25·93	10·60	15·27	Fermoy, 12 months	10
28th	Field Battery	125	100	2	4	4·40	872·0	16·00	32·00	36·02	13·16	16·08	Athlone, 12 months. Detachment at Curragh.	5
30th	Field Battery	128	82	.	2	5·62	635·6		15·62	42·79	15·66	24·04	Colchester, 9 months. To India	—
37th	Field Battery	115	80	1	1	4·46	695·6	8·69	8·69	38·78	14·19	20·40	Hilsea, 12 months	6
38th	Field Battery	112	84	...	1	5·62	750·0	.	8·93	50·18	18·37	24·40	Aldershot, 12 months	5
39th	Field Battery	4	8	...	—	·85	—	..	—	—	—	—	Woolwich, 1 month. From India	—
43rd	Field Battery	128	91	2	6	5·67	710·9	15·62	46·87	44·30	16·21	22·80	Shorncliffe and Lydd, 12 months	1
44th	Field Battery	110	145	1	5	8·51	1325·7	9·09	45·45	77·36	28·31	21·35	Colchester, 10 months. From India	—
52nd	Field Battery	136	70	1	3	4·23	514·7	7·35	22·06	81·10	11·38	22·10	Weedon, 12 months	9
56th	Field Battery	156	104	—	6	6·35	666·7	—	38·46	40·70	14·90	22·34	Aldershot, 12 months	9
57th	Field Battery	120	71	1	7	7·56	591·7	8·33	58·33	63·00	23·06	38·96	Woolwich, 10 months. To India	—

58th	Field Battery - - - -	140	113	—	4	7·04	758·4	—	26·84	47·25	17·29	22·81	Woolwich, 8½ months; Clonmel, 3½ months.	9
61st	Field Battery - - - -	111	107	1	3	5·23	964·0	9·01	27·03	47·03	17·21	17·85	Aldershot, 9 months; Hilsea, 3 months	5
62nd	Field Battery - - - -	133	91	—	3	3·42	684·2	—	22·56	25·71	9·41	13·75	Ipswich, 7½ months; Aldershot, 3½ months; Okehampton, 1 month.	9
63rd	Field Battery - - - -	123	66	—	4	4·81	536·6	—	32·52	39·10	14·31	26·67	Newcastle-on-Tyne, 9 months; Bristol, 3 months.	8
64th	Field Battery - - - -	112	84	—	2	4·32	750·0	—	17·86	38·57	14·11	18·81	Sheffield, 12 months - - -	8
65th	Field Battery - - - -	94	109	1	2	6·51	1057·6	10·64	21·27	69·25	25·34	23·96	Hilsea, 10 months. Aldershot for drill. From India.	—
66th	Field Battery - - - -	136	97	2	2	4·35	713·2	14·71	14·71	31·99	11·70	16·41	Glasgow, 12 months - - -	8
67th	Field Battery - - - -	158	66	—	1	4·96	417·7	—	6·33	31·39	11·49	27·49	Limerick, 8½ months; Woolwich, 3½ months.	10
68th	Field Battery - - - -	5	9	—	—	·28	—	—	—	—	—	—	Woolwich, 20 days. From India. -	—
69th	Field Battery - - - -	144	59	—	4	4·41	409·7	—	27·76	30·62	11·21	27·34	Weedon, 12 months. Aldershot for drill.	10
73rd	Field Battery - - - -	126	89	—	2	4·07	706·3	—	15·87	37·06	13·56	19·20	Exeter and Okehampton, 12 months -	6
74th	Field Battery - - - -	130	129	—	5	6·91	92·3	—	38·46	53·15	19·45	19·60	Newcastle-on-Tyne, 12 months -	6
75th	Field Battery - - - -	131	83	—	4	7·21	633·6	—	30·53	54·94	20·11	31·74	Bristol, 9 months; Colchester, 3 months.	9
76th	Field Battery - - - -	117	94	1	4	3·97	803·4	8·55	34·19	33·93	12·42	15·46	Athlone, 12 months - - -	3
77th	Field Battery - - - -	139	84	1	—	2·09	604·3	7·19	—	15·04	5·50	9·11	Coventry, 12 months - - -	6
78th	Field Battery - - - -	121	46	—	1	2·02	330·2	—	8·26	16·69	6·11	16·07	Longford, 12 months. Detachment at Curragh.	5
79th	Field Battery - - - -	122	81	—	2	4·18	663·9	—	16·39	34·26	12·54	18·88	Sheffield, 12 months - - -	5
80th	Field Battery - - - -	121	68	—	3	6·04	562·0	—	24·79	49·92	18·27	32·41	Hilsea, ½ month; Woolwich, 11½ months.	11
81st	Field Battery - - - -	124	83	—	—	5·29	669·3	—	—	42·66	15·61	23·33	Trowbridge, 12 months - - -	1
82nd	Field Battery - - - -	123	62	—	1	4·45	504·1	—	8·13	36·18	13·24	26·27	Woolwich, 9½ months; Aldershot, 2½ months.	1
83rd	Field Battery - - - -	125	63	—	1	6·11	504·0	—	8·00	48·88	17·89	35·50	Woolwich, 9½ months; Aldershot, 2½ months.	1
84th	Field Battery - - - -	128	75	1	3	7·83	585·9	7·81	23·44	61·17	22·38	38·19	Woolwich, 9½ months; Aldershot, 2½ months.	1

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	ROYAL ARTILLERY—*cont.*										days.	days.		
85th	Field Battery - - - -	114	80	3	3	7·00	701·7	26·31	26·31	61·40	22·47	32·01	Woolwich, 9¾ months; Aldershot, 2¼ months.	1
86th	Field Battery - - - -	119	82	—	1	6·13	689·1	—	8·40	51·51	18·85	27·36	Woolwich, 9¾ months; Aldershot, 2¼ months.	1
87th	Field Battery - - - -	126	83	—	2	7·19	658·7	—	15·87	57·06	20·88	31·69	Woolwich, 9¾ months; Aldershot, 2¼ months.	1
4th	Mountain Battery - -	233	139	—	4	8·33	596·6	—	17·17	35·75	13·08	21·95	Newport and Brecon, 12 months -	3
	Garrison Artillery, Eastern Division	1,646	939	6	37	46·58	570·5	3·64	22·48	28·30	10·36	18·16	Various - - - - -	—
	Garrison Artillery, Southern Division.	2,772	1,202	13	37	71·19	440·1	4·69	13·38	25·68	9·40	21·36	Various - - - - -	—
	Garrison Artillery, Western Division	1,729	966	10	27	58·87	558·7	5·78	15·61	34·05	12·46	22·29	Various - - - - -	—
	District Establishment - -	967	176	4	13	13·20	182·0	4·14	13·44	13·65	4·99	27·42	Various - - - - -	—
	Regimental District Staff - -	903	211	10	8	12·58	233·7	11·07	8·86	13·93	5·10	21·80	Woolwich - - - -	—
	School of Gunnery - - -	393	104	2	4	6·18	264·6	5·09	10·18	15·72	5·75	21·72	Shoeburyness - - - -	—
	Various - - - - -	342	114	1	9	14·99	333·3	2·92	26·31	43·83	16·04	48·16	Various - - - - -	—
	Total Royal Artillery -	16,975	9,383	81	307	582·30	552·7	4·77	18·08	34·30	12·55	22·71		
	ROYAL ENGINEERS.													
	Royal Engineers - - -	4,470	1,490	20	43	86·22	333·3	4·47	9·62	19·29	7·06	21·19		

	FOOT GUARDS.													
1st	Grenadier Guards	616	454	3	23	35·11	737·0	4·87	37·34	57·00	20·86	28·30	London, 12 months	32
2nd	Grenadier Guards	647	623	3	32	57·46	962·9	4·64	49·46	88·81	32·50	33·75	London, 4 months; Windsor, 8 months	5
3rd	Grenadier Guards	559	295	—	18	25·47	527·7	—	32·20	45·56	16·67	31·60	London, 12 months	11
1st	Coldstream Guards	636	395	2	32	39·03	621·1	3·14	50·31	61·37	22·46	36·16	London, 12 months	11
2nd	Coldstream Guards	612	412	2	28	41·07	673·2	3·27	45·75	67·11	24·56	36·48	London, 12 months	14
1st	Scots Guards	617	412	2	19	33·08	667·7	3·24	30·79	51·99	19·03	28·50	London, 8 months; Windsor, 4 months	14
2nd	Scots Guards	713	302	2	18	22·06	423·6	2·80	25·24	30·94	11·32	26·71	Dublin, 12 months	11
	Detachments	767	261	—	5	26·67	340·3	—	6·52	34·77	12·73	37·42	Various.	
	Total Foot Guards	5,167	3,154	14	175	278·95	610·4	2·71	33·87	53·99	19·76	32·37		
	INFANTRY.													
1st	Royal Scots	615	514	1	12	32·06	835·8	1·63	19·51	52·19	19·10	22·86	Chatham, 7½ months; Edinburgh, 3 months. Aldershot for manœuvres.	5
2nd	Royal West Surrey Regiment	591	599	3	20	27·04	1013·4	5·08	33·84	45·14	16·52	16·30	Woking, 12 months	3
2nd	East Kent Regiment	654	395	1	10	22·21	604·0	1·53	15·29	33·96	12·43	20·58	Kilkenny, 12 months	10
2nd	Royal Lancaster Regiment	545	757	4	15	39·16	1389·0	7·34	27·52	71·85	26·30	18·93	Devonport, 10 months. From India.	—
1st	Northumberland Fusiliers	537	475	3	10	34·95	884·5	5·59	18·62	65·08	23·82	17·20	Portsmouth, 9 months. To Gibraltar	—
1st	Royal Warwickshire Regiment	592	573	—	13	32·93	967·9	—	21·96	55·62	20·36	21·03	Chatham, 9 months. From Ceylon	—
2nd	Royal Fusiliers	657	602	2	58	39·82	916·3	3·04	88·28	60·61	22·18	24·21	Belfast, 12 months	7
2nd	(King's) Liverpool Regiment	669	1,019	2	45	56·20	1523·2	2·99	07·26	84·01	30·75	20·19	Colchester, 12 months	4
2nd	Norfolk Regiment	654	403	—	16	27·13	616·2	—	24·46	41·48	15·18	24·63	Aldershot, 12 months	6
2nd	Lincolnshire Regiment	728	550	1	22	43·12	755·5	1·37	30·22	59·23	21·68	28·70	Woolwich, 12 months	1
2nd	Devonshire Regiment	779	405	3	19	22·99	519·9	3·85	24·39	29·51	10·80	20·77	Pembroke Dock, 12 months	3

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
											days.	days.		
	INFANTRY—*cont.*													
1st	Suffolk Regiment	783	484	—	8	28·87	618·1	—	10·22	36·87	13·49	21·83	Aldershot, 3 months; Warley, 8 months; London, 1 month.	4
2nd	Somersetshire Light Infantry	708	347	3	21	20·75	490·1	4·24	29·66	29·31	10·73	21·88	Alderney and Guernsey, 12 months	2
2nd	West Yorkshire Regiment	445	602	4	15	31·08	1352·8	8·99	33·71	69·84	25·56	18·90	Dover, 9 months. From Ashanti	—
2nd	East Yorkshire Regiment	650	377	—	9	23·87	580·0	—	13·85	36·72	13·44	23·17	Curragh, 12 months	8
2nd	Bedfordshire Regiment	598	478	—	13	28·59	799·3	—	21·74	47·81	17·49	21·88	Aldershot, 8 months; Lichfield, 4 months.	4
2nd	Leicestershire Regiment	597	351	2	9	20·37	587·9	3·35	15·07	34·12	12·49	21·24	Aldershot, 9 months; Cork, 3 months	6
1st	Royal Irish Regiment	646	428	3	8	23·95	663·5	4·64	12·38	37·07	13·57	20·47	Limerick and Templemore, 12 months	11
1st	Yorkshire Regiment	641	454	1	13	27·18	708·3	1·56	20·28	42·40	15·52	21·91	Curragh, 12 months	7
1st	Lancashire Fusiliers	589	654	1	33	29·38	1110·3	1·70	56·03	49·88	18·26	16·44	Athlone, 12 months	16
1st	Royal Scots Fusiliers	430	417	2	18	27·70	969·8	4·65	41·86	64·42	23·58	24·31	Aldershot, 9 months. To India	—
2nd	Royal Scots Fusiliers	180	123	2	1	5·63	683·3	11·11	5·56	31·28	11·45	16·76	Chatham, 3 months. From India	—
2nd	Cheshire Regiment	603	383	2	8	15·16	635·1	3·32	13·27	25·14	9·20	14·48	Buttevant, 12 months	7
2nd	Royal Welsh Fusiliers	378	329	2	7	15·03	870·4	5·29	18·52	39·76	14·55	16·72	Manchester, 6 months. To Malta	—
2nd	South Wales Borderers	681	409	2	19	26·75	600·6	2·94	27·90	39·28	14·38	23·94	Aldershot, 12 months	3
1st	King's Own Scottish Borderers	684	507	2	10	32·82	741·2	2·92	14·62	47·98	17·30	23·34	York, 9 months; Aldershot, 3 months	5
2nd	Scottish Rifles	558	383	2	12	18·88	686·4	3·58	21·50	33·83	12·38	18·03	Parkhurst, 12 months. Aldershot manœuvres.	1

1st	Royal Inniskilling Fusiliers	641	222	2	13	11·07	346·3	3·12	20·28	17·27	6·32	18·26	Kinsale, 12 months	7
2nd	Gloucestershire Regiment	672	722	5	12	40·01	1074·4	7·44	17·86	59·54	21·79	20·26	Devonport, 12 months	2
1st	Worcestershire Regiment	52	65	—	—	2·25	1250·0	—	—	43·27	15·84	12·67	Devonport, 1½ months. From Aden	—
2nd	East Lancashire Regiment	604	673	2	41	44·75	1114·2	3·31	67·88	74·09	27·12	24·34	Aldershot, 12 months	1
2nd	East Surrey Regiment	620	408	—	19	25·21	658·1	—	30·64	40·66	14·88	22·61	Dover and Lydd, 12 months	1
2nd	Duke of Cornwall's Light Infantry	622	260	1	16	12·23	418·0	1·61	25·72	19·66	7·20	17·22	Newry 12 months	10
1st	Border Regiment	637	551	1	8	32·81	865·0	1·57	12·56	51·51	18·85	21·79	Aldershot, 12 months	6
1st	Royal Sussex Regiment	692	358	—	4	14·14	604·0	—	5·78	20·43	7·48	12·38	Fermoy, 8 months; Brighton, 3½ months. Aldershot for manœuvres.	11
2nd	Hampshire Regiment	676	349	—	11	21·06	516·3	—	16·27	31·15	11·40	22·09	Dublin, Birr, and Curragh, 12 months	8
1st	South Staffordshire Regiment	666	465	1	6	23·43	698·2	1·50	9·01	35·18	12·87	18·43	Lichfield, 8 months; Aldershot, 4 months.	3
2nd	Dorsetshire Regiment	676	355	—	15	19·34	525·1	—	22·10	28·61	10·47	19·94	Enniskillen and Londonderry, 12 months.	16
1st	South Lancashire Regiment	653	560	6	23	32·02	857·6	9·19	35·22	49·03	17·95	20·98	Cork and Fermoy, 12 months	10
1st	Welsh Regiment	622	765	2	20	58·70	1229·9	3·21	32·15	94·37	34·44	28·00	Devonport, 12 months	3
2nd	Royal Highlanders	692	365	2	18	17·50	527·4	2·89	26·01	25·29	9·26	17·56	Edinburgh, 9 months; York, 3 months.	15
1st	Oxfordshire Light Infantry	554	435	2	10	26·61	785·2	3·61	18·05	48·03	17·58	22·39	Dublin, 12 months	9
1st	Essex Regiment	690	446	1	5	17·42	646·4	1·45	7·25	25·25	9·24	14·29	Fermoy, 8 months; Warley, 3½ months. Aldershot for manœuvres.	12
1st	Derbyshire Regiment	748	745	1	28	58·35	996·0	1·34	37·43	78·00	28·55	28·66	Dublin, 7 months; Curragh, 5 months	18
2nd	Loyal North Lancashire Regiment	709	730	3	14	29·79	1029·6	4·23	19·75	42·02	15·38	14·94	Preston, 12 months. Detachments, Fleetwood and Hulme.	13
2nd	Northamptonshire Regiment	604	432	2	20	19·11	715·2	3·31	33·11	31·64	11·58	16·20	Jersey, 12 months	4
2nd	Royal Berkshire Regiment	730	576	2	12	40·02	789·0	2·74	16·44	54·82	20·06	25·42	Devonport, 10½ months; Aldershot, 1½ months.	15
2nd	Royal West Kent Regiment	651	819	5	18	51·87	1258·1	7·68	27·63	79·71	29·17	23·18	Dublin, 12 months. Detachments at Sligo and Curragh.	14
1st	Yorkshire Light Infantry	649	340	2	13	18·87	523·9	3·08	20·03	29·07	10·64	20·30	Mullingar, 12 months	9

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
											days.	days.		
	INFANTRY—*cont.*													
2nd	Shropshire Light Infantry	613	320	4	4	23·34	522·0	6·52	6·52	38·07	13·93	26·69	Portland, 9 months; Hilsea, 3 months	15
1st	Middlesex Regiment	209	153	1	9	11·21	732·1	4·78	43·06	53·64	19·63	26·82	Aldershot, 4 months. To Cape Town	—
3rd	King's Royal Rifle Corps	636	355	—	19	24·29	558·2	—	29·87	38·19	13·98	25·04	Shorncliffe 12 months	5
4th	King's Royal Rifle Corps	675	449	3	21	27·58	665·2	4·44	31·11	40·86	14·95	22·46	Dover, 5 months; Aldershot, 7 months.	4
2nd	Wiltshire Regiment	641	353	3	9	29·90	550·7	4·68	14·04	46·64	19·07	34·61	Hilsea, 9 months; Portsmouth, 3 months.	1
1st	Manchester Regiment	658	630	2	25	37·22	957·4	3·04	37·99	56·55	20·70	21·62	Aldershot, 12 months	14
2nd	North Staffordshire Regiment	604	492	2	20	34·19	814·6	3·31	33·11	56·61	20·72	25·40	Belfast, 12 months	8
1st	York and Lancaster Regiment	692	646	2	14	34·31	933·5	2·89	20·23	49·87	18·25	19·55	Colchester, 12 months	12
1st	Durham Light Infantry	770	705	5	17	45·89	915·6	6·49	22·08	59·60	21·81	23·81	Dublin, 12 months	9
1st	Seaforth Highlanders	654	414	2	11	27·52	678·9	3·06	16·82	42·08	15·40	22·68	Aldershot, 12 months	14
2nd	Gordon Highlanders	642	427	1	7	19·98	665·1	1·56	10·90	31·12	11·30	17·12	Glasgow, 8 months; Aldershot, 4 months.	15
1st	Royal Irish Rifles	626	433	2	11	21·25	691·7	3·19	17·57	33·94	12·42	17·95	Brighton and Lydd, 9 months; Aldershot, 3 months.	15
2nd	Royal Irish Fusiliers	621	418	5	27	23·62	673·1	8·05	43·48	38·04	13·92	20·63	Cork, 12 months	12
1st	Connaught Rangers	658	529	4	21	29·17	803·9	6·08	30·91	44·33	16·22	20·18	Bradford and Sheffield, 12 months	5
1st	Argyll and Sutherland Highlanders	693	529	4	15	32·51	763·3	5·77	21·64	46·91	17·17	22·50	Aldershot, 9 months; Glasgow, 3 months.	5
1st	Leinster Regiment	674	569	1	20	25·02	844·2	1·48	29·67	37·12	13·58	16·08	Tipperary, 12 months	2

1st	Royal Munster Fusiliers	741	456	2	17	30·91	615·4	2·70	22·94	41·71	15·26	24·92	Curragh, 7½ months; Fermoy, 4½ months.	13
1st	Royal Dublin Fusiliers	562	717	3	21	45·72	1275·8	5·34	37·37	31·35	29·77	23·34	Portsmouth, 12 months	10
2nd	Rifle Brigade	579	405	—	15	24·23	699·5	—	25·00	41·85	15·32	21·85	Aldershot, 12 months	16
4th	Rifle Brigade	625	584	3	20	31·38	934·4	4·80	32·90	50·21	18·38	19·63	Aldershot, 9 months; Dublin, 3 months.	6
	Mounted Infantry	224	152	—	—	6·95	678·6	—	—	31·03	11·36	16·74	Aldershot, 12 months	—
	Other Infantry	1,094	729	—	64	74·04	666·4	—	58·50	67·68	24·77	37·17	Various	—
	Total Infantry Regiments	43,943	34,154	137	1,157	2030·41	777·2	3·12	26·33	46·21	16·91	21·76		
	REGIMENTAL DEPÔTS.													
Depôt	Royal Scots	142	45	—	—	2·03	316·9	—	—	14·30	5·23	16·70	Glencorse	Since formation.
„	Royal West Surrey Regiment	155	155	1	7	7·02	1000·0	6·45	45·16	45·29	16·58	16·58	Guildford	„
„	East Kent Regiment	143	113	—	3	3·59	790·2	—	20·98	25·10	9·19	11·63	Canterbury	„
„	Royal Lancaster Regiment	205	79	1	1	2·80	385·4	4·88	4·88	13·66	5·00	13·97	Lancaster	„
„	Northumberland Fusiliers	126	94	—	—	3·75	746·0	—	—	29·76	10·89	14·60	Newcastle	„
„	Royal Warwickshire Regiment	169	61	1	1	3·70	360·9	5·92	5·92	21·89	8·01	23·19	Warwick	„
„	Royal Fusiliers	155	58	3	—	2·33	341·9	19·35	—	15·03	5·50	16·08	Hounslow	„
„	Liverpool Regiment	186	121	—	1	3·86	648·6	—	5·32	20·53	7·51	11·68	Warrington	„
„	Norfolk Regiment	147	45	—	1	2·29	306·1	—	6·80	15·58	5·70	18·63	Norwich	„
„	Lincolnshire Regiment	114	13	—	2	·52	114·0	—	17·54	4·56	1·67	14·65	Lincoln	„
„	Devonshire Regiment	139	34	—	2	2·48	244·6	—	14·39	17·84	6·53	26·69	Exeter	„
„	Suffolk Regiment	118	54	2	—	2·09	457·6	16·95	—	17·71	6·48	14·15	Bury St. Edmund's	„
„	Somersetshire Light Infantry	94	38	1	—	1·56	404·2	10·64	—	16·59	6·07	15·02	Taunton	„
„	West Yorkshire Regiment	162	67	4	3	3·66	413·6	24·69	18·52	22·59	8·26	19·93	York	„
„	East Yorkshire Regiment	115	27	1	—	1·40	234·8	8·69	—	12·17	4·45	18·97	Beverley	„

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	ROYAL ARTILLERY—*cont.*										days.	days.		
14th	Field Battery	105	82	—	3	3·66	780·9	—	28·57	34·86	12·76	16·34	Newcastle, 3 months; Ipswich, 9 months.	8
16th	Field Battery	5	8	—	—	·75	—	—	—	—	—	—	Aldershot, ½ month. To India	—
18th	Field Battery	148	94	1	1	4·85	635·1	6·76	6·76	32·77	11·99	18·88	Exeter, 6 months; Okehampton, 1 month; Aldershot, 5 months.	9
19th	Field Battery	123	81	—	1	3·77	658·5	—	8·13	30·65	11·22	17·04	Christchurch, 7 months; Exeter and Okehampton, 5 months.	3
20th	Field Battery	140	76	1	4	4·49	542·8	7·14	28·57	32·07	11·74	21·62	Shorncliffe and Lydd, 9 months; Ipswich, 3 months.	3
25th	Field Battery	150	104	—	1	4·34	693·3	—	6·67	28·93	10·59	15·27	Fermoy, 12 months	10
28th	Field Battery	125	109	2	4	4·49	872·0	16·00	32·00	35·92	13·15	15·08	Athlone, 12 months. Detachment at Curragh.	5
30th	Field Battery	128	82	—	2	5·52	635·6	—	15·50	42·79	15·66	24·64	Colchester, 9 months. To India	—
37th	Field Battery	115	80	1	1	4·46	695·6	8·69	8·69	38·78	14·19	20·40	Hilsea, 12 months	6
38th	Field Battery	112	84	—	1	5·62	750·0	—	8·93	50·18	18·37	24·49	Aldershot, 12 months	5
39th	Field Battery	4	8	—	—	·35	—	—	—	—	—	—	Woolwich, ½ month. From India	—
42nd	Field Battery	128	91	2	6	5·67	710·9	15·62	46·87	44·30	16·21	22·80	Shorncliffe and Lydd, 12 months	1
44th	Field Battery	110	145	1	5	8·51	1325·7	9·09	45·45	77·36	28·31	21·35	Colchester, 10 months. From India	—
52nd	Field Battery	136	70	1	3	4·23	514·7	7·35	22·06	31·10	11·38	22·10	Weedon, 12 months	9
56th	Field Battery	156	104	—	6	6·35	666·7	—	38·46	40·70	14·90	22·84	Aldershot, 12 months	9
57th	Field Battery	120	71	1	7	7·56	591·7	8·33	58·33	63·00	23·06	38·96	Woolwich, 10 months. To India	—

58th	Field Battery - - - -	149	113	—	4	7·04	758·4	—	26·84	47·25	17·29	22·81	Woolwich, 8½ months; Clonmel, 3½ months.	9
61st	Field Battery - - - -	111	107	1	3	5·22	964·0	9·01	27·03	47·03	17·21	17·85	Aldershot, 9 months; Hilsea, 3 months	5
62nd	Field Battery - - - -	133	91	—	3	3·42	684·2	—	22·56	25·71	9·41	13·75	Ipswich, 7½ months; Aldershot, 3½ months; Okehampton, 1 month.	9
63rd	Field Battery - - - -	123	66	—	4	4·81	536·6	—	32·52	39·10	14·31	26·67	Newcastle-on-Tyne, 9 months; Bristol, 3 months.	8
64th	Field Battery - - - -	112	84	—	2	4·32	750·0	—	17·86	38·57	14·11	18·81	Sheffield, 12 months - - -	8
65th	Field Battery - - - -	94	109	1	2	6·51	1057·6	10·64	21·27	69·25	25·34	23·96	Hilsea, 10 months. Aldershot for drill. From India.	—
66th	Field Battery - - - -	136	97	2	2	4·35	713·2	14·71	14·71	31·99	11·70	16·41	Glasgow, 12 months - - -	8
67th	Field Battery - - - -	158	66	—	1	4·96	417·7	—	6·33	31·39	11·49	27·49	Limerick, 8½ months; Woolwich, 3½ months.	10
68th	Field Battery - - - -	5	9	—	—	·28	—	—	—	—	—	—	Woolwich, 20 days. From India. -	—
69th	Field Battery - - - -	144	59	—	4	4·41	409·7	—	27·78	30·62	11·21	27·34	Weedon, 12 months. Aldershot for drill.	10
73rd	Field Battery - - - -	126	89	—	2	4·67	706·3	—	15·87	37·06	13·56	19·20	Exeter and Okehampton, 12 months -	6
74th	Field Battery - - - -	130	129	—	5	6·91	92·3	—	38·46	53·15	19·45	·19·60	Newcastle-on-Tyne, 12 months -	6
75th	Field Battery - - - -	131	83	—	4	7·21	633·6	—	30·53	54·94	20·11	31·74	Bristol, 9 months; Colchester, 3 months.	9
76th	Field Battery - - - -	117	94	1	4	3·97	803·4	8·55	34·19	33·93	12·42	15·46	Athlone, 12 months - - -	3
77th	Field Battery - - - -	139	84	1	—	2·09	604·3	7·19	—	15·04	5·50	9·11	Coventry, 12 months - - -	6
78th	Field Battery - - - -	121	46	—	1	2·02	380·2	—	8·26	16·69	6·11	16·07	Longford, 12 months. Detachment at Curragh.	5
79th	Field Battery - - - -	122	81	—	2	4·18	663·9	—	16·39	34·26	12·54	18·88	Sheffield, 12 months - - -	5
80th	Field Battery - - - -	121	68	—	3	6·04	562·0	—	24·79	49·92	18·27	32·41	Hilsea, ½ month; Woolwich, 11½ months.	11
81st	Field Battery - - - -	124	83	—	—	5·29	669·3	—	—	42·66	15·61	23·33	Trowbridge, 12 months - - -	1
82nd	Field Battery - - - -	123	62	—	1	4·45	504·1	—	8·13	36·18	13·24	26·27	Woolwich, 9½ months; Aldershot, 2½ months.	1
83rd	Field Battery - - - -	125	63	—	1	6·11	504·0	—	8·00	48·88	17·89	35·50	Woolwich, 9½ months; Aldershot, 2½ months.	1
84th	Field Battery - - - -	128	75	1	3	7·83	585·9	7·81	23·44	61·17	22·38	38·19	Woolwich, 9½ months; Aldershot, 2½ months.	1

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
											days.	days.		
	ROYAL ARTILLERY—*cont.*													
85th	Field Battery - - - -	114	80	3	3	7·00	701·7	26·31	26·31	61·40	22·47	32·01	Woolwich, 9¾ months; Aldershot, 2¼ months.	1
86th	Field Battery - - - -	119	82	—	1	6·13	689·1	—	8·40	51·51	18·85	27·36	Woolwich, 9¾ months; Aldershot, 2¼ months.	1
87th	Field Battery - - - -	126	83	—	2	7·19	658·7	—	15·87	57·06	20·88	31·69	Woolwich, 9¾ months; Aldershot, 2¼ months.	1
4th	Mountain Battery - -	233	139	—	4	8·33	596·6	—	17·17	35·75	13·08	21·95	Newport and Brecon, 12 months -	3
	Garrison Artillery, Eastern Division	1,646	939	6	37	46·58	570·5	3·64	22·48	28·30	10·36	18·16	Various - - - - -	—
	Garrison Artillery, Southern Division.	2,772	1,202	13	37	71·19	440·1	4·69	13·38	25·68	9·40	21·36	Various - - - - -	—
	Garrison Artillery, Western Division	1,729	966	10	27	58·87	558·7	5·78	15·61	34·05	12·46	22·29	Various - - - - -	—
	District Establishment - -	967	176	4	13	13·20	182·0	4·14	13·44	13·65	4·99	27·42	Various - - - - -	—
	Regimental District Staff - -	903	211	10	8	12·58	233·7	11·07	8·86	13·93	5·10	21·80	Woolwich - - - -	—
	School of Gunnery - - -	393	104	2	4	6·18	264·6	5·09	10·18	15·72	5·75	21·72	Shoeburyness - - - -	—
	Various - - - - -	342	114	1	9	14·99	333·3	2·92	26·31	43·83	16·04	48·16	Various - - - - -	—
	Total Royal Artillery -	16,975	9,383	81	307	582·80	552·7	4·77	18·08	34·30	12·55	22·71		
	ROYAL ENGINEERS.													
	Royal Engineers - - - -	4,470	1,490	20	43	86·22	333·3	4·47	9·62	19·29	7·06	21·19		

	FOOT GUARDS.													
1st	Grenadier Guards	616	454	3	23	35·11	737·0	4·87	37·34	57·00	20·86	28·30	London, 12 months	32
2nd	Grenadier Guards	647	623	3	32	57·46	962·9	4·64	49·46	88·81	32·50	33·75	London, 4 months; Windsor, 8 months	5
3rd	Grenadier Guards	559	295	—	18	25·47	527·7	—	32·20	45·56	16·67	31·60	London, 12 months	11
1st	Coldstream Guards	636	395	2	32	39·03	621·1	3·14	50·31	61·37	22·46	36·16	London, 12 months	11
2nd	Coldstream Guards	612	412	2	28	41·07	673·2	3·27	45·75	67·11	24·56	36·48	London, 12 months	14
1st	Scots Guards	617	412	2	19	32·08	667·7	3·24	30·79	51·99	19·03	28·50	London, 8 months; Windsor, 4 months	14
2nd	Scots Guards	713	302	2	18	22·06	423·6	2·80	25·24	30·94	11·32	26·71	Dublin, 12 months	11
	Detachments	767	261	—	5	26·67	340·3	—	6·53	34·77	12·73	37·42	Various.	
	Total Foot Guards	5,167	3,154	14	175	278·95	610·4	2·71	33·87	53·99	19·76	32·37		
	INFANTRY.													
1st	Royal Scots	615	514	1	12	32·06	835·8	1·63	19·51	52·19	19·10	22·86	Chatham, 7½ months; Edinburgh, 3 months. Aldershot for manœuvres.	5
2nd	Royal West Surrey Regiment	591	599	3	20	27·04	1013·4	5·03	33·84	45·14	16·52	16·30	Woking, 12 months	3
2nd	East Kent Regiment	654	395	1	10	22·21	604·0	1·53	15·29	33·96	12·43	20·58	Kilkenny, 12 months	10
2nd	Royal Lancaster Regiment	545	757	4	15	39·16	1389·0	7·34	27·52	71·85	26·30	18·93	Devonport, 10 months. From India.	—
1st	Northumberland Fusiliers	537	475	3	10	34·95	884·5	5·59	18·62	65·06	23·82	17·20	Portsmouth, 9 months. To Gibraltar	—
1st	Royal Warwickshire Regiment	592	573	—	13	32·93	967·9	—	21·96	55·62	20·36	21·03	Chatham, 9 months. From Ceylon	—
2nd	Royal Fusiliers	657	602	2	58	39·82	916·3	3·04	88·28	60·61	22·18	24·21	Belfast, 12 months	7
2nd	(King's) Liverpool Regiment	669	1,019	2	45	56·20	1523·2	2·99	07·26	84·01	30·75	20·19	Colchester, 12 months	4
2nd	Norfolk Regiment	654	403	—	16	27·13	616·2	—	24·46	41·48	15·18	24·63	Aldershot, 12 months	6
2nd	Lincolnshire Regiment	728	550	1	22	43·12	755·5	1·37	30·22	59·23	21·68	28·70	Woolwich, 12 months	1
2nd	Devonshire Regiment	779	405	3	19	22·99	519·9	3·85	24·39	29·51	10·80	20·77	Pembroke Dock, 12 months	3

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength. Admitted.	Died.	Invalided.	Average Constantly Sick.	Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
											days.	days.		
	INFANTRY—*cont.*													
1st	Suffolk Regiment	783	484	—	8	28·87	618·1	—	10·22	36·87	13·49	21·83	Aldershot, 3 months; Warley, 8 months; London, 1 month.	4
2nd	Somersetshire Light Infantry	708	347	3	21	20·75	490·1	4·24	29·66	29·31	10·73	21·88	Alderney and Guernsey, 12 months	2
2nd	West Yorkshire Regiment	445	602	4	15	31·08	1352·8	8·99	33·71	69·84	25·56	18·90	Dover, 9 months. From Ashanti	—
2nd	East Yorkshire Regiment	650	377	—	9	23·87	580·0	—	13·85	36·72	13·44	23·17	Curragh, 12 months	8
2nd	Bedfordshire Regiment	598	478	—	13	28·59	799·3	—	21·74	47·81	17·49	21·88	Aldershot, 8 months; Lichfield, 4 months.	4
2nd	Leicestershire Regiment	597	351	2	9	20·37	587·9	3·35	15·07	34·12	12·49	21·24	Aldershot, 9 months; Cork, 3 months	6
1st	Royal Irish Regiment	646	428	3	8	23·95	663·5	4·64	12·38	37·07	13·57	20·47	Limerick and Templemore, 12 months	11
1st	Yorkshire Regiment	641	454	1	13	27·18	708·3	1·36	20·28	42·40	15·52	21·91	Curragh, 12 months	7
1st	Lancashire Fusiliers	589	654	1	33	29·38	1110·3	1·70	56·03	49·88	18·26	16·44	Athlone, 12 months	16
1st	Royal Scots Fusiliers	430	417	2	18	27·70	969·8	4·65	41·86	64·42	23·58	24·31	Aldershot, 9 months. To India	—
2nd	Royal Scots Fusiliers	180	123	2	1	5·03	683·3	11·11	5·56	31·28	11·45	16·76	Chatham, 3 months. From India	—
2nd	Cheshire Regiment	603	383	2	8	15·16	635·1	3·32	13·27	25·14	9·20	14·48	Buttevant, 12 months	7
2nd	Royal Welsh Fusiliers	378	329	2	7	15·08	870·4	5·29	18·52	39·76	14·55	16·72	Manchester, 6 months. To Malta	—
2nd	South Wales Borderers	681	409	2	19	26·75	600·6	2·94	27·90	39·28	14·38	23·94	Aldershot, 12 months	3
1st	King's Own Scottish Borderers	684	507	2	10	32·82	741·2	2·92	14·62	47·98	17·30	23·34	York, 9 months; Aldershot, 3 months	5
2nd	Scottish Rifles	558	383	2	12	18·88	686·4	3·58	21·50	33·83	12·38	18·03	Parkhurst, 12 months. Aldershot manœuvres.	1

1st	Royal Inniskilling Fusiliers - -	641	222	2	13	11·07	346·3	3·12	20·28	17·27	6·32	18·26	Kinsale, 12 months - - -	7
2nd	Gloucestershire Regiment - -	672	722	5	12	40·01	1074·4	7·44	17·86	59·54	21·79	20·26	Devonport, 12 months - - -	2
1st	Worcestershire Regiment - -	52	65	—	—	2·25	1250·0	—	—	43·27	15·84	12·67	Devonport, 1½ months. From Aden -	—
2nd	East Lancashire Regiment - -	604	673	2	41	44·75	1114·2	3·31	67·88	74·09	27·12	24·34	Aldershot, 12 months - - -	1
2nd	East Surrey Regiment - -	620	408	—	19	25·21	658·1	—	30·64	40·66	14·88	22·61	Dover and Lydd, 12 months - -	1
2nd	Duke of Cornwall's Light Infantry -	622	260	1	16	12·23	418·0	1·61	25·72	19·66	7·20	17·22	Newry 12 months - - -	10
1st	Border Regiment - -	637	551	1	8	32·81	865·0	1·57	12·56	51·51	18·85	21·79	Aldershot, 12 months - - -	6
1st	Royal Sussex Regiment - -	692	358	—	4	14·14	604·0	—	5·78	20·43	7·48	12·38	Fermoy, 8 months; Brighton, 3½ months. Aldershot for manœuvres.	11
2nd	Hampshire Regiment - - -	676	349	—	11	21·06	516·3	—	16·27	31·15	11·40	22·09	Dublin, Birr, and Curragh, 12 months	8
1st	South Staffordshire Regiment -	666	465	1	6	23·43	698·2	1·50	9·01	35·18	12·87	18·43	Lichfield, 8 months; Aldershot, 4 months.	3
2nd	Dorsetshire Regiment - -	676	355	—	15	19·34	525·1	—	22·19	28·61	10·47	19·94	Enniskillen and Londonderry, 12 months.	16
1st	South Lancashire Regiment -	653	560	6	23	32·02	857·6	9·19	35·22	49·03	17·95	20·98	Cork and Fermoy, 12 months - -	10
1st	Welsh Regiment - - -	622	765	2	20	58·70	1229·9	3·21	32·15	94·37	34·44	28·00	Devonport, 12 months - - -	3
2nd	Royal Highlanders - - -	692	365	2	18	17·50	527·4	2·89	26·01	25·29	9·26	17·56	Edinburgh, 9 months; York, 3 months.	15
1st	Oxfordshire Light Infantry - -	554	435	2	10	26·61	785·2	3·61	18·05	48·03	17·58	22·39	Dublin, 12 months - - -	9
1st	Essex Regiment - - -	690	446	1	5	17·42	646·4	1·45	7·25	25·25	9·24	14·29	Fermoy, 8 months; Warley, 3½ months. Aldershot for manœuvres.	12
1st	Derbyshire Regiment - -	748	745	1	28	58·35	996·6	1·34	37·43	78·00	28·55	28·66	Dublin, 7 months; Curragh, 5 months	18
2nd	Loyal North Lancashire Regiment -	709	730	3	14	29·79	1029·6	4·23	19·75	42·02	15·38	14·94	Preston, 12 months. Detachments, Fleetwood and Hulme.	13
2nd	Northamptonshire Regiment -	604	432	2	20	19·11	715·2	3·31	33·11	31·64	11·58	16·20	Jersey, 12 months - - -	4
2nd	Royal Berkshire Regiment - -	730	576	2	12	40·02	789·0	2·74	16·44	54·82	20·06	25·42	Devonport, 10½ months; Aldershot, 1½ months.	15
2nd	Royal West Kent Regiment -	651	819	5	18	51·87	1258·1	7·68	27·65	79·71	29·17	23·18	Dublin, 12 months. Detachments at Sligo and Curragh.	14
1st	Yorkshire Light Infantry - -	649	340	2	13	18·87	523·9	3·08	20·03	29·07	10·64	20·30	Mullingar, 12 months - - -	9

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
											days.	days.		
	INFANTRY—*cont.*													
2nd	Shropshire Light Infantry - -	613	320	4	4	23·34	522·0	6·52	6·52	38·07	13·93	26·69	Portland, 9 months; Hilsea, 3 months	15
1st	Middlesex Regiment - - -	209	153	1	9	11·21	732·1	4·78	43·06	53·64	19·63	26·82	Aldershot, 4 months. To Cape Town	—
3rd	King's Royal Rifle Corps - -	636	355	—	19	24·29	558·2	—	29·87	38·19	13·93	25·04	Shorncliffe 12 months - - -	5
4th	King's Royal Rifle Corps - -	675	449	3	21	27·58	665·2	4·44	31·11	40·86	14·95	22·48	Dover, 5 months; Aldershot, 7 months.	4
2nd	Wiltshire Regiment - - -	641	353	3	9	29·90	550·7	4·68	14·04	46·64	19·07	34·61	Hilsea, 9 months; Portsmouth, 3 months.	1
1st	Manchester Regiment - -	658	630	2	25	37·22	957·4	3·04	37·99	56·55	20·70	21·62	Aldershot, 12 months - - -	14
2nd	North Staffordshire Regiment -	604	492	2	20	34·19	814·6	3·31	33·11	56·61	20·72	23·40	Belfast, 12 months - - -	8
1st	York and Lancaster Regiment -	692	646	2	14	34·31	933·5	2·89	20·23	49·87	18·25	19·55	Colchester, 12 months - - -	12
1st	Durham Light Infantry - -	770	705	5	17	45·89	915·6	6·49	22·08	59·60	21·81	23·81	Dublin, 12 months - - -	9
1st	Seaforth Highlanders - -	654	414	2	11	27·52	678·9	3·06	16·82	42·08	15·40	22·68	Aldershot, 12 months - - -	14
2nd	Gordon Highlanders - - -	642	427	1	7	19·98	665·1	1·56	10·90	31·12	11·39	17·12	Glasgow, 8 months; Aldershot, 4 months.	15
1st	Royal Irish Rifles - - -	626	433	2	11	21·25	691·7	3·19	17·57	33·94	12·42	17·95	Brighton and Lydd, 9 months; Aldershot, 3 months.	15
2nd	Royal Irish Fusiliers - - -	621	418	5	27	23·62	673·1	8·05	43·48	38·04	13·92	20·68	Cork, 12 months - - - -	12
1st	Connaught Rangers - - -	658	529	4	21	29·17	803·9	6·08	30·91	44·33	16·22	20·18	Bradford and Sheffield, 12 months -	5
1st	Argyll and Sutherland Highlanders	693	529	4	15	32·51	763·3	5·77	21·64	46·91	17·17	22·50	Aldershot, 9 months; Glasgow, 3 months.	5
1st	Leinster Regiment - - -	674	569	1	20	25·02	844·2	1·48	29·67	37·12	13·58	16·08	Tipperary, 12 months - - -	2

1st	Royal Munster Fusiliers	741	456	2	17	30·91	615·4	2·70	22·94	41·71	15·26	24·92	Curragh, 7½ months; Fermoy, 4½ months.	13
1st	Royal Dublin Fusiliers	562	717	3	21	45·72	1275·8	5·34	37·37	31·35	29·77	23·34	Portsmouth, 12 months	10
2nd	Rifle Brigade	579	405	—	15	24·23	699·5	—	25·00	41·85	15·32	21·85	Aldershot, 12 months	16
4th	Rifle Brigade	625	584	3	20	31·38	934·4	4·80	32·90	50·21	18·38	19·63	Aldershot, 9 months; Dublin, 3 months.	6
	Mounted Infantry	224	152	—	—	6·95	678·6	—	—	31·03	11·36	16·74	Aldershot, 12 months	—
	Other Infantry	1,094	729	—	64	74·04	666·4	—	58·50	67·68	24·77	37·17	Various	—
	Total Infantry Regiments	43,943	34,154	137	1,157	2030·41	777·2	3·12	26·33	46·21	16·91	21·76		
	REGIMENTAL DEPÔTS.													
Depôt	Royal Scots	142	45	—	—	2·03	316·9	—	—	14·30	5·23	16·70	Glencorse	Since formation.
"	Royal West Surrey Regiment	155	155	1	7	7·02	1000·0	6·45	45·16	45·29	16·58	16·58	Guildford	"
"	East Kent Regiment	143	113	—	3	3·59	790·2	—	20·98	25·10	9·19	11·63	Canterbury	"
"	Royal Lancaster Regiment	205	79	1	1	2·80	385·4	4·88	4·88	13·66	5·00	12·97	Lancaster	"
"	Northumberland Fusiliers	126	94	—	—	3·75	746·0	—	—	29·76	10·89	14·60	Newcastle	"
"	Royal Warwickshire Regiment	169	61	1	1	3·70	360·9	5·92	5·92	21·89	8·01	22·19	Warwick	"
"	Royal Fusiliers	155	53	3	—	2·33	341·9	19·35	—	15·03	5·50	16·08	Hounslow	"
"	Liverpool Regiment	186	121	—	1	3·86	643·6	—	5·82	20·53	7·51	11·68	Warrington	"
"	Norfolk Regiment	147	45	—	1	2·29	306·1	—	6·80	15·58	5·70	18·63	Norwich	"
"	Lincolnshire Regiment	114	13	—	2	·52	114·0	—	17·54	4·56	1·67	14·65	Lincoln	"
"	Devonshire Regiment	139	34	—	2	2·48	244·6	—	14·39	17·84	6·53	26·69	Exeter	"
"	Suffolk Regiment	118	54	2	—	2·09	457·6	16·95	—	17·71	6·48	14·15	Bury St. Edmund's	"
"	Somersetshire Light Infantry	94	38	1	—	1·56	404·2	10·64	—	16·59	6·07	15·02	Taunton	"
"	West Yorkshire Regiment	162	67	4	3	3·66	413·6	24·69	18·52	22·59	8·26	19·93	York	"
"	East Yorkshire Regiment	115	27	1	—	1·40	234·8	8·69	—	12·17	4·45	18·97	Beverley	"

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	REGIMENTAL DEPÔTS—*cont.*										days.	days.		
Depôt	Bedfordshire Regiment - -	138	56	—	1	2·14	405·8	—	7·25	15·51	5·68	13·99	Bedford - - - - - -	Since formation.
"	Leicestershire Regiment - -	171	115	—	1	4·02	672·5	—	5·85	23·51	8·60	12·79	Leicester - - - - - -	"
"	Royal Irish Regiment - -	165	134	—	5	4·21	812·1	—	30·30	25·51	9·34	11·50	Clonmel - - - - - -	"
"	Yorkshire Regiment - - -	170	26	1	—	1·45	152·9	5·88	—	8·53	3·12	20·41	Richmond - - - - -	"
"	Lancashire Fusiliers - - -	157	66	—	1	3·23	420·4	—	6·37	20·57	7·53	17·91	Bury - - - - - -	"
"	Royal Scots Fusiliers - - -	133	126	—	3	3·76	947·4	—	22·56	28·27	10·35	109·2	Ayr - - - - - -	"
"	Cheshire Regiment - - -	135	87	—	1	4·52	644·4	—	7·41	33·48	12·25	19·01	Chester - - - - - -	"
"	Royal Welsh Fusiliers - -	162	169	—	6	7·18	1043·2	—	37·04	44·32	16·22	15·55	Wrexham - - - - - -	"
"	South Wales Borderers - -	171	87	—	6	4·61	508·8	—	35·09	26·96	9·87	19·39	Brecon - - - - - -	"
"	King's Own Scottish Borderers -	106	91	—	7	3·17	858·5	—	66·04	29·90	10·94	12·75	Berwick-on-Tweed - - -	"
"	Scottish Rifles - - - -	147	82	—	3	2·88	557·8	—	20·41	19·59	7·17	12·85	Hamilton - - - - - -	"
"	Royal Inniskilling Fusiliers - -	184	46	3	—	1·81	250·0	16·30	—	9·84	3·60	14·40	Omagh - - - - - -	"
"	Gloucestershire Regiment - -	174	107	1	2	3·73	614·9	5·75	11·49	21·43	7·84	12·76	Horfield, Bristol - - - -	"
"	Worcestershire Regiment - -	136	96	1	1	2·88	705·9	7·35	7·35	21·18	7·75	10·98	Worcester - - - - -	"
"	East Lancashire Regiment - -	142	73	—	3	2·74	514·1	—	21·13	19·29	7·06	13·74	Burnley - - - - - -	"
"	East Surrey Regiment - -	152	32	1	1	2·36	210·5	6·58	6·58	15·53	5·68	26·99	Kingston-on-Thames - - -	"
"	Duke of Cornwall's Light Infantry	131	113	—	3	3·16	862·6	—	22·90	24·12	8·83	10·23	Bodmin - - - - - -	"

Depôt	West Riding Regiment	128	124	1	2	4·92	968·7	7·81	15·63	38·44	14·06	14·52	Halifax	Since formation.
„	Border Regiment	148	47	2	1	1·78	317·6	13·51	6·76	12·03	4·40	13·86	Carlisle	„
„	Royal Sussex Regiment	143	62	2	2	2·09	433·6	13·99	13·99	14·61	5·35	12·34	Chichester	„
„	Hampshire Regiment	174	69	3	3	3·87	396·5	17·24	17·24	22·24	8·14	20·53	Winchester	„
„	South Staffordshire Regiment	156	70	—	1	2·32	448·7	—	6·41	14·87	5·44	12·13	Lichfield	„
„	Dorsetshire Regiment	166	138	—	2	4·60	831·3	—	12·05	27·71	10·14	12·20	Dorchester	„
„	South Lancashire Regiment	149	113	—	—	2·94	758·4	—	—	19·73	7·22	9·52	Warrington	„
„	Welsh Regiment	140	99	1	4	3·78	707·1	7·14	28·57	27·00	9·88	13·97	Cardiff	„
„	Royal Highlanders	119	13	—	—	·62	109·2	—	—	5·21	1·91	17·51	Perth	„
„	Oxfordshire Light Infantry	116	122	—	3	7·23	1051·7	—	25·86	62·33	22·81	21·69	Oxford	„
„	Essex Regiment	159	93	2	1	4·03	584·9	12·58	6·29	25·35	9·28	15·86	Warley	„
„	Derbyshire Regiment	144	19	—	1	1·36	131·9	—	6·94	9·44	3·45	26·15	Derby	„
„	North Lancashire Regiment	184	164	1	1	6·60	891·3	5·43	5·43	35·87	13·13	14·73	Preston	„
„	Northamptonshire Regiment	142	92	—	3	2·53	647·9	—	21·13	17·82	6·52	10·06	Northampton	„
„	Royal Berkshire Regiment	132	83	—	1	2·56	628·8	—	7·58	19·39	7·10	11·28	Reading	„
„	Royal West Kent Regiment	132	86	2	—	3·13	651·5	15·15	—	23·71	8·68	13·33	Maidstone	„
„	Yorkshire Light Infantry	142	80	—	1	3·52	563·4	—	7·04	24·79	9·07	16·10	Pontefract	„
„	Shropshire Light Infantry	136	45	—	1	1·77	330·9	—	7·35	13·01	4·76	14·38	Shrewsbury	„
„	Middlesex Regiment	157	53	—	1	3·97	337·6	—	6·37	25·29	9·25	27·42	Hounslow	„
„	Wiltshire Regiment	136	103	—	1	3·60	757·3	—	7·35	26·47	9·69	12·78	Devizes	„
„	Manchester Regiment	145	87	—	2	8·50	600·0	—	13·79	24·14	8·83	14·72	Ashton-under-Lyne	„
„	North Staffordshire Regiment	166	94	3	1	3·79	566·3	18·07	6·02	22·83	8·36	14·76	Lichfield	„
„	York and Lancaster Regiment	122	68	—	—	2·74	557·4	—	—	22·46	8·22	14·74	Pontefract	„

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year, &c.	Years at Home since last return from Foreign Service.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	REGIMENTAL DEPÔTS—*cont.*										days.	days.		
Depôt	Durham Light Infantry	159	134	—	2	5·79	842·8	—	12·58	36·41	13·32	15·81	Newcastle	Since formation.
"	Highland Light Infantry	118	81	—	3	2·44	686·4	—	25·42	20·68	7·56	11·02	Hamilton	"
"	Seaforth Highlanders	107	59	1	4	2·05	551·4	9·34	37·38	19·16	7·01	12·71	Fort George	"
"	Gordon Highlanders	111	13	1	—	·63	117·1	9·01	—	5·67	2·07	17·72	Aberdeen	"
"	Cameron Highlanders	147	45	2	6	1·89	306·1	13·60	40·82	12·86	4·70	15·37	Inverness	"
"	Royal Irish Rifles	140	57	1	4	2·38	407·1	7·14	28·57	17·00	6·22	15·28	Belfast	"
"	Royal Irish Fusiliers	189	42	1	2	1·92	222·2	5·29	10·58	10·16	3·72	16·73	Armagh	"
"	Connaught Rangers	166	91	1	4	3·92	548·2	6·02	24·10	23·61	8·64	15·77	Galway	"
"	Argyll and Sutherland Highlanders	140	121	2	8	3·47	864·3	14·28	57·14	24·79	9·07	10·53	Stirling	"
"	Leinster Regiment	160	41	—	1	1·73	256·2	—	6·25	10·81	3·96	15·47	Birr	"
"	Royal Munster Fusiliers	186	53	2	2	1·88	284·9	10·75	10·75	10·11	3·70	12·98	Tralee	"
"	Royal Dublin Fusiliers	185	78	—	2	2·90	421·6	—	10·81	15·68	5·74	13·61	Naas	"
"	King's Royal Rifle Corps and Rifle Brigade.	477	490	5	10	24·19	1027·2	10·48	20·96	50·71	18·56	18·07	Gosport	"
	Provisional Battalion	487	330	—	18	22·47	677·6	—	36·96	46·14	16·89	24·92	Shorncliffe	"
	Detached	69	11	1	1	·99	159·4	14·49	14·49	14·39	5·27	33·14	Various Stations	"
	Total Regimental Depôts	10,923	6,075	55	164	256·77	556·2	5·03	15·01	23·51	8·60	15·46		
	Garrison Staff and Departments	7,150	2,328	34	80	157·04	325·6	4·75	11·19	21·96	8·04	24·07		

ABSTRACT No. XXV.—Table, taken from the Reports of the Principal Medical Officers, showing the various Corps which served in the different Commands Abroad during the Year 1896, and some of the most important of their Health Statistics.

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
	GIBRALTAR.												days.	days.		
	Royal Artillery.															
5th	Eastern Division - -	132	79	1	—	1	1	4·88	598·5	7·58	7·58	36·97	13·53	22·61	Gibraltar, 10 months. To Malta, 29th October.	3
14th	Eastern Division - -	138	114	—	—	—	2	9·64	826·1	—	14·49	69·86	25·57	30·95	Gibraltar, 12 months - - -	2
15th	Eastern Division - -	147	83	—	—	—	—	7·53	564·6	—	—	51·22	18·75	33·20	Gibraltar, 12 months - - -	2
17th	Eastern Division - -	151	94	—	—	—	2	6·63	622·5	—	13·25	43·91	16·07	25·81	Gibraltar, 10 months. To Malta, 29th October.	1
21st	Eastern Division - -	142	67	1	—	1	2	4·49	471·8	7·04	14·08	31·62	11·57	24·53	Gibraltar, 12 months - - -	1
22nd	Eastern Division - -	180	88	—	—	—	2	9·41	488·9	—	11·11	52·28	19·13	39·14	Gibraltar, 12 months - - -	1
23rd	Eastern Division - -	179	139	—	—	—	4	11·36	776·5	—	22·35	63·46	23·23	29·91	Gibraltar, 12 months - - -	1
2nd	Southern Division - -	27	23	—	—	—	—	1·72	851·9	—	—	63·70	23·31	27·37	Gibraltar, 2 months. From Malta, 6th November.	5
36th	Southern Division - -	25	23	—	—	—	—	1·59	920·0	—	—	63·60	23·28	25·30	Gibraltar, 2 months. From Malta, 6th November.	7
	Total - - -	1,121	710	2	—	2	13	57·25	633·4	1·78	11·60	51·07	18·69	29·51		
	Royal Engineers - -	336	140	1	—	1	1	7·45	416·7	2·98	2·98	22·17	8·11	19·48	Gibraltar, 12 months - -	Various.

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
													days.	days.		
	GIBRALTAR—*cont.*															
	Infantry Regiments.															
1st	Northumberland Fusiliers -	111	113	3	—	3	—	6·74	1018·0	27·03	—	60·72	22·22	21·83	Gibraltar, 3 months. From England, 10th October.	—
1st	West Yorkshire Regiment -	777	728	2	—	2	4	65·27	936·8	2·57	5·15	84·00	30·74	32·81	Gibraltar, 9 months. To Hong Kong, 10th October.	1
1st	South Wales Borderers -	1,010	813	4	—	4	3	55·07	805·0	3·96	2·97	54·52	19·95	24·79	Gibraltar, 12 months - - -	1
2nd	Dorsetshire Regiment - -	88	54	1	—	1	—	3·05	613·6	11·36	—	34·66	12·69	20·67	Gibraltar, 3 months. From England, 10th October.	—
1st	Cameron Highlanders -	986	592	3	2	5	4	45·42	600·4	5·07	4·06	46·05	16·85	28·08	Gibraltar, 12 months - - -	4
	Other Corps - - -	19	—	—	—	—	—	1·32	—	—	—	70·47	25·79	—	- - - - - -	—
	Total - - -	2,991	2,300	13	2	15	11	176·87	769·0	3·6	3·68	59·13	21·64	28·15		
	Garrison Staff and Departments.															
	Army Service Corps - -	53	22	—	—	—	2	1·76	415·1	—	37·74	33·21	12·15	29·28	Gibraltar, 12 months - - -	Various.
	Medical Staff Corps - -	75	52	1	—	1	2	2·63	693·3	13·33	26·67	35·07	12·83	18·51	Gibraltar, 12 months - - -	„
	Army Ordnance Corps -	37	9	—	—	—	—	·49	243·2	—	—	13·24	4·84	19·93	Gibraltar, 12 months - - -	„
	Garrison Staff, &c. - -	17	6	—	—	—	1	·29	352·9	—	58·82	17·06	6·24	17·69	Gibraltar, 12 months - - -	„
	Total - - -	182	89	1	—	1	5	5·17	489·0	5·49	27·47	28·41	10·40	21·26		
	Grand total -	4,630	3,239	17	2	19	30	246·74	699·5	4·10	6·48	53·29	19·50	27·88		

	MALTA.															
	Royal Artillery.															
5th	Eastern Division	26	18	1	—	1	—	1·19	692·3	38·46	—	45·77	16·75	24·20	St. Elmo, 2 months. From Gibraltar, 2nd November.	3
17th	Eastern Division	26	10	—	—	—	—	·99	384·6	—	—	38·08	13·94	36·23	Fort Tigne and Hutments, 2 months. From Gibraltar, 2nd November.	1
2nd	Southern Division	144	81	2	—	2	5	6·37	562·5	13·89	34·72	44·24	16·19	28·78	Fort Tigne and Hutments, 10 months. To Gibraltar, 2nd November.	5
8th	Southern Division	188	132	2	1	3	6	10·25	702·1	15·96	31·91	54·52	19·95	28·42	Fort St. Elmo and St. James' Cavalier, 10 months. Fort Ricasoli, 2 months.	2
16th	Southern Division	179	62	—	—	—	—	3·91	346·4	—	—	21·84	7·99	23·08	Fort Ricasoli, 12 months	1
22nd	Southern Division	173	69	1	1	2	4	4·83	398·8	11·56	23·12	27·92	10·22	25·62	Fort Ricasoli, 12 months	5
26th	Southern Division	165	102	—	—	—	6	8·93	618·2	—	36·36	54·12	19·81	32·04	Fort Tigne and Hutments, 12 months	1
29th	Southern Division	185	115	1	—	1	1	8·26	621·6	5·41	5·41	44·65	16·34	26·29	St. Elmo, 10 months. Fort Tigne and Hutments, 2 months.	7
30th	Southern Division	194	102	1	—	1	6	6·70	525·8	5·15	30·93	34·54	12·64	24·04	Ricasoli, 10 months; St. Elmo and St. James' Cavalier, 2 months.	2
38th	Southern Division	139	102	1	—	1	1	6·49	733·8	7·19	7·19	46·69	17·09	23·29	Fort Tigne and Hutments, 10 months. To Gibraltar, 2nd November.	7
	Staff	10	—	—	—	—	—	—	—	—	—	—	—	—		Various.
	Total	1,429	793	9	2	11	29	57·92	554·9	7·70	20·29	40·53	14·83	26·73		
	Royal Engineers	260	55	1	—	1	2	3·06	211·5	3·84	7·69	11·77	4·31	20·36	St. Francis' Barracks, 12 months	Various.
	Infantry Regiments.															
1st	Royal Lancaster Regiment	872	760	10	—	10	20	51·09	871·6	11·47	22·94	58·59	21·44	24·60	Imtarfa Barracks, 12 months	1
1st	Royal Warwickshire Regiment	868	812	4	—	4	4	38·60	935·5	4·61	4·61	44·47	16·28	17·40	Pembroke Camp, 12 months; Detachment at Gozo.	1
1st	Lincolnshire Regiment	981	717	6	—	6	23	57·07	730·9	6·12	23·45	58·18	21·29	29·13	Lower St. Elmo, 12 months; Detachments at St. Angelo and Salvatore.	1
2nd	Royal Welsh Fusiliers	380	539	1	—	1	1	23·96	1418·4	2·63	2·63	63·05	23·08	16·27	Verdala Barracks, 5½ months. From England, 16th July.	—
1st	Gloucestershire Regiment	—	2	—	1	1	8	2·53	—	—	—	—	—	—		—

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
	MALTA—*cont.*												days.	days.		
	Infantry Regiments—cont.															
2nd	Worcestershire Regiment	973	577	14	—	14	34	56·21	901·3	14·39	34·94	57·77	21·14	23·46	Isola District, 12 months	1
1st	West Riding Regiment	932	1,020	2	—	2	19	62·37	1094·4	2·15	20·39	66·92	24·49	22·38	Verdala Barracks, 6½ months; Floriana and Nôtre Dame Barracks, 5½ months.	1
2nd	King's Royal Rifle Corps	528	257	1	—	1	17	25·00	486·7	1·89	32·20	47·35	17·33	35·60	Floriana and Nôtre Dame Barracks, 6½ months. To South Africa, 16th July.	1
1st	North Staffordshire Regiment	1	2	—	—	—	1	·86	—	—	—	—	—	—	. . . . . .	—
1st	Highland Light Infantry	885	681	12	—	12	11	49·92	769·5	13·56	12·43	56·41	20·64	26·83	Manoel Forts and Huts, 12 months	2
	Other Corps	2	3	—	1	1	3	·67	—	—	—	—	—	—	. . . . . .	—
	Total	6,422	5,670	50	2	52	141	363·28	882·9	8·10	21·96	57·35	20·90	23·77		
	Garrison Staff and Departments.															
	Army Service Corps	37	9	1	—	1	2	1·08	243·2	27·03	54·05	29·19	10·68	43·92	Various	Various.
	Medical Staff Corps	123	66	1	—	1	2	2·64	536·6	8·13	16·26	21·46	7·86	14·64	Various	„
	Army Ordnance Corps	20	1	—	—	—	—	·01	50·0	—	—	·50	—	—	Various	„
	Other Staff and Departmental Corps.	25	8	—	—	—	2	·53	320·0	—	80·00	21·20	7·76	24·25	Various	„
	Total	205	84	2	—	2	6	4·26	409·8	9·75	29·27	20·78	7·61	18·56		
	Grand Total	8,316	6,602	62	4	66	178	433·52	798·9	7·93	21·40	52·13	19·08	24·03		

	CANADA.															
	Royal Artillery.															
1st	Western Division	141	88	—	—	—	*6	4·83	624·1	—	48·55	34·26	12·54	20·09	Halifax, N.S., 12 months	2
20th	Western Division	141	82	—	—	—	3	3·81	581·6	—	21·28	27·02	9·89	17·01	Halifax, N.S., 12 months	1
	District Establishment	47	—	—	—	—	—	—	—	—	—	—	—	—	. . . . . .	—
	Total	329	170	—	—	—	*9	8·64	516·7	—	27·36	26·26	9·61	18·60		
	Royal Engineers.															
18th	Company	101	35	—	—	—	2	2·04	333·3	—	19·05	19·42	7·11	21·34	Halifax, N.S., and Victoria B.C., 12 months.	9
40th	Company	63	17	—	—	—	—	·57	269·8	—	—	9·05	3·31	12·27	Halifax, N.S., 12 months	8
	Staff	14	—	1	—	1	—	—	—	71·43	—	—	—	—	. . . . . .	—
	Total	178	52	1	—	1	2	2·61	292·1	5·62	11·24	14·66	5·37	18·37		
	Infantry Regiments.															
1st	Royal Berkshire Regiment	938	629	3	—	3	13	31·18	670·6	3·20	13·86	33·24	12·17	18·14	Halifax, N.S., 12 months	1
	Other Corps	9	—	—	—	—	—	—	—	—	—	—	—	—	. . . . . .	—
		947	629	3	—	3	13	31·18	664·2	3·17	13·73	32·92	12·05	18·14		
	Garrison Staff and Departments.	50	5	—	1	1	1	·23	100·0	20·00	20·00	4·60	1·68	16·84	Halifax, N.S., 12 months	Various.
	Grand Total	1.504	856	4	1	5	*25	42·66	569·1	3·32	16·62	28·36	10·38	18·24		

---

* Includes 1 man discharged in the Command.

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
	Bermuda.												days.	days.		
	Royal Artillery.															
3rd	Western Division	149	73	1	—	1	2	5·81	489·9	6·71	13·42	38·99	14·27	29·13	St. George's, 12 months. Detachments at Watford and Ireland Island.	2
19th	Western Division	150	72	3	—	3	3	6·14	480·0	20·20	20·20	40·93	14·98	31·21	St. George's, 12 months. Detachments at Watford and Ireland Island.	2
	Total	299	145	4	—	4	5	11·95	484·9	13·38	16·72	39·97	14·63	30·10		
	Royal Engineers.															
27th	Company	60	22	1	—	1	1	1·20	366·7	16·66	16·66	20·00	7·32	19·96	St. George's, 12 months	8
36th	Company	106	53	2	—	2	2	2·16	500·0	18·87	18·87	20·38	7·46	14·92	Prospect, 12 months. Detachment at Boaz.	6
	Total	166	75	3	—	3	3	3·36	451·8	18·07	18·07	20·24	7·41	16·40		
	Infantry Regiments.															
2nd	Leinster Regiment	849	415	1	—	1	9	19·46	488·0	1·18	10·60	22·92	8·39	17·16	Prospect, 12 months. Detachments at St. George's and Watford.	1
	Other Corps	2	2	—	—	—	1	1·51	—	—	—	—	—	—		—
	Total	851	417	1	—	1	10	20·97	490·0	1·17	11·75	24·64	9·02	18·41		

	Garrison Staff and Departments.														
	Army Service Corps	10	—	—	—	—	—	—	—	—	—	—	—	—	- - - - - -	—
	Medical Staff Corps	21	6	—	—	—	1	·73	285·7	—	47·62	34·76	12·72	44·53	Various	Various.
	Army Ordnance Corps	33	8	—	—	—	—	·20	242·4	—	—	6·06	2·22	9·15	"	"
	Garrison Staff	7	2	—	—	—	—	·05	285·7	—	—	7·14	2·61	9·15	"	"
	Total	71	16	—	—	—	1	·98	225·3	—	14·08	13·80	5·05	22·42		
	Grand Total	1,387	653	8	—	8	19	37·26	470·8	5·77	13·70	26·86	9·83	20·88		
	West Indies.															
	(Barbados, &c.)															
	Royal Artillery.															
23rd	Western Division	134	227	—	—	—	4	11·04	1694·0	—	29·85	82·39	30·15	17·80	Barbados and St. Lucia, 12 months	2
	District Establishment, &c.	6	5	—	—	—	—	·37	825·1	—	—	61·05	22·44	27·20	Barbados and St. Lucia, 12 months	Various.
	Total	140	232	—	—	—	4	11·41	1657·1	—	28·57	81·50	29·83	18·00		
	Royal Engineers	15	3	—	—	—	1	·17	200·0	—	66·67	11·33	4·15	20·74	Barbados and St. Lucia, 12 months	Various.
	Infantry Regiments.															
1st	Liverpool Regiment	571	849	2	—	2	13	58·06	1486·9	3·50	22·77	101·68	37·22	25·03	Barbados and St. Lucia, 12 months	1
	Other Corps	7	5	—	—	—	1	·15	714·3	—	142·86	21·42	7·84	10·98	- - - - - - -	—
	Total	578	854	2	—	2	14	58·21	1477·5	3·46	24·22	100·71	36·86	24·95		
	Garrison Staff and Departments.	33	19	1	—	1	1	·77	575·8	30·30	30·30	23·33	8·54	14·83	Barbados and St. Lucia, 12 months	Various.
	Total, Barbados, &c.	766	1,108	3	—	3	20	70·56	1446·5	3·92	26·11	92·11	33·71	23·31		

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
	WEST INDIES—*cont.*												days.	days.		
	(JAMAICA.)															
	Royal Artillery.															
14th	Western Division . .	130	152	2	—	2	1	8·60	1169·2	15·38	7·69	66·15	24·21	20·71	Detachments at all stations, 12 months	2
	Jamaica Company . .	4	1	—	—	—	—	·04	250·0	—	—	10·00	3·66	14·64	Port Royal, 12 months . .	—
	Total . .	134	153	2	—	2	1	8·64	1141·8	14·93	7·46	64·48	23·60	20·67		
	Royal Engineers .	42	12	—	—	—	—	·70	285·7	—	—	16·67	6·10	21·35	Detachments at all stations, 12 months	Various.
	Infantry Regiments.															
1st	Liverpool Regiment . .	298	241	1	—	1	3	19·38	808·7	3·36	10·97	65·03	23·80	20·43	Newcastle and Up Park Camp, 12 months.	3
	Other Corps . . .	2	1	1	—	1	2	·46	500·0	500·00	500·00	230·00	84·18	168·36	. . . .	—
	West India Regiment . .	17	7	—	—	—	—	·44	470·6	—	—	25·88	9·47	20·11	Up Park Camp, 12 months . .	2
	Total . .	317	249	2	—	2	5	20·28	785·5	6·31	15·07	63·97	23·41	29·80		
	Garrison Staff and Departments.	34	17	1	—	1	—	1·19	500·0	29·41	—	35·00	12·81	25·63	Various stations . . .	Various.
	Total Jamaica . .	527	431	5	—	5	6	30·81	817·8	9·49	11·39	58·45	21·39	26·16		
	Grand Total, West Indies .	1,293	1,539	8	—	8	26	101·37	1190·2	6·19	20·11	78·40	28·69	24·11		

	SOUTH AFRICA AND ST. HELENA.															
	Cavalry.															
7th	Hussars - - - -	314	285	6	—	6	5	17·19	907·6	19·11	15·92	54·75	20·04	22·08	Pietermaritzburg, 12 months - -	1
9th	Lancers - - - -	151	152	—	—	—	—	7·96	1006·6	—	—	52·72	19·29	19·17	Pietermaritzburg, 3 months. From England, 22nd September.	—
	Total - -	465	437	6	—	6	5	25·15	939·8	12·90	10·75	54·09	19·80	21·06		
	Royal Artillery.															
10th	Mountain Battery - -	157	187	3	—	3	3	14·03	1191·1	19·11	19·11	89·36	32·71	27·46	Pietermaritzburg, 12 months - -	3
25th	Western Division - -	145	133	—	—	—	6	10·22	917·2	—	44·38	70·48	25·80	28·12	Cape Town, Wynberg, and Simonstown, 12 months.	2
26th	Western Division - -	112	115	2	—	2	3	8·35	1026·8	17·86	26·79	74·55	27·29	26·57	Cape Town, Wynberg, and Simonstown, 12 months.	1
	St. Helena Detachment -	90	56	—	—	—	1	2·95	622·2	—	11·11	32·78	12·00	19·28	St. Helena, 12 months - -	7
	District Establishment -	50	12	—	—	—	—	·73	240·0	—	—	14·60	5·34	22·27	Cape Town and Simonstown, 12 months.	Various.
	Total - -	554	503	5	—	5	13	36·28	907·9	9·03	23·47	65·49	23·97	26·40		
	Royal Engineers.	94	30	—	—	—	*2	2·23	319·1	—	21·28	23·72	8·68	27·21	Cape Town, Simonstown, Wynberg, and St. Helena, 12 months.	10
	Infantry Regiments.															
1st	Leicestershire Regiment -	949	768	2	—	2	14	44·93	809·3	2·11	14·75	47·34	17·33	21·41	Wynberg, 11 months. From Barbados, 18th January.	11
2nd	West Riding Regiment -	774	709	4	—	4	15	43·24	916·0	5·17	19·38	55·87	20·45	22·32	Pietermaritzburg and Eshowe, 12 months.	3
1st	Royal Highlanders - -	27	46	—	—	—	3	3·90	1703·7	—	111·11	144·44	52·87	31·03	Cape Town, 25 days. To India, 25th January.	—
1st	Middlesex Regiment - -	382	396	1	—	1	1	22·42	1036·6	2·62	2·62	58·69	21·48	20·72	Cape Town and Wynberg, 7 months. From England, 18th May.	—
2nd	King's Royal Rifle Corps -	370	240	2	—	2	3	19·55	648·6	5·41	8·11	52·84	19·34	29·81	Cape Town and Wynberg, 4 months. From Malta, 5th August.	—

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
													days.	days.		
	SOUTH AFRICA AND ST. HELENA—*cont.*															
	Infantry Regiments—cont.															
2nd	York and Lancaster Regiment	454	474	1	—	1	6	31·60	1044·1	2·20	13·22	69·60	25·47	24·40	Wynberg and Pietermaritzburg, 12 months.	5
	Mounted Infantry	151	138	—	—	—	2	6·86	913·9	—	13·25	45·43	16·63	18·19	Wynberg, 2 months. Pietermaritzburg, 6 months. From England, 18th May.	—
	Other Corps	1	2	—	—	—	—	·14	—	—	—	—	—	—	. . . .	—
	Total	3,108	2,773	10	—	10	44	172·04	892·2	3·22	14·16	55·55	20·33	22·79		
	Garrison Staff and Departments.															
	Army Service Corps	38	12	—	—	—	—	·52	315·8	—	—	13·68	5·01	15·86	Various stations	Various.
	Medical Staff Corps	78	34	—	—	—	—	2·14	435·9	—	—	27·44	10·04	23·04	"	"
	Army Ordnance Corps	43	16	—	—	—	1	·88	372·1	—	23·26	20·47	7·49	20·13	"	"
	Other Staff and Departmental Corps.	32	5	—	—	—	—	·27	156·3	—	—	8·44	3·09	19·76	"	"
	Total	191	67	—	—	—	1	3·81	350·8	—	5·23	19·95	7·30	20·81		
	Grand Total	4,412	3,810	21	—	21	*65	240·11	863·5	4·76	14·73	54·42	19·92	23·07		

* Includes 1 man discharged in the Command.

	MAURITIUS.															
	Royal Artillery.															
24th	Western Division	134	251	2	—	2	20	18·12	1873·1	14·93	149·25	135·22	49·49	26·42	Curepipe and Port Louis, 12 months	2
	District Staff, &c.	10	9	—	—	—	1	·75	900·0	—	100·0	75·00	27·45	30·50	Port Louis, 12 months	—
	Total	144	260	2	—	2	21	18·87	1805·6	13·89	145·83	131·04	47·96	26·56		
	Royal Engineers	36	35	—	—	—	3	1·44	972·2	—	83·33	40·00	14·64	15·06	Port Louis and Curepipe	—
	Infantry Regiments.															
1st	Royal Highlanders	56	55	—	—	—	1	4·27	982·1	—	17·86	76·25	27·91	28·42	Curepipe and Port Louis, 1 month. To India, 6th February.	—
2nd	York and Lancaster Regiment	421	439	4	—	4	8	30·61	1042·8	9·50	19·00	72·66	26·59	25·49	Curepipe and Port Louis, 11 months. From South Africa, 6th February.	—
	Total	477	494	4	—	4	9	34·88	1035·6	8·39	18·87	73·12	26·76	25·84		
	Garrison Staff and Departments.	19	10	—	—	—	1	·71	526·3	—	52·63	37·36	13·67	25·97	Curepipe and Port Louis, 12 months	Various.
	Grand Total	676	799	6	—	6	34	55·90	1181·9	8·88	50·30	82·69	30·26	25·60		
	CEYLON.															
	Royal Artillery.															
6th	Southern Division	129	85	1	—	1	1	4·95	658·9	7·75	7·75	38·37	14·04	21·31	Colombo, 11 months; Trincomali, 1 month.	1
37th	Southern Division	124	101	3	—	3	3	5·18	814·5	24·19	24·19	41·77	15·29	18·77	Trincomali, 11 months; Colombo, 1 month.	1
		253	186	4	—	4	4	10·13	735·2	15·81	15·81	40·04	14·65	19·93		
	Royal Engineers	85	48	—	—	—	—	1·72	564·7	—	—	20·24	7·41	13·12	Colombo and Trincomali, 12 months	Various.

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
	CEYLON—*cont.*												days.	days.		
	Infantry Regiments.															
2nd	Royal Warwickshire Regiment.	141	127	1	—	1	2	6·27	900·7	7·09	14·18	44·47	16·28	18·07	Colombo, 2 months. To England, 25th February.	—
1st	Loyal North Lancashire Regiment.	819	1,389	6	—	6	24	68·16	1696·0	7·33	29·30	83·22	30·40	17·96	Colombo, 10 months. From India, 24th February.	—
	Other Corps	—	1	—	—	—	—	·04	—	—	—	—	—	—	. . . . . .	—
	Total	960	1,517	7	—	7	26	74·47	1580·2	7·29	27·08	77·57	28·39	17·97		
	Garrison Staff and Departments.	38	14	—	—	—	1	·40	368·4	—	26·32	10·53	3·85	10·46	Various stations	Various.
	Grand Total	1,336	1,765	11	—	11	31	86·72	1321·1	8·23	23·20	64·91	23·76	17·98		
	CHINA.															
	Royal Artillery.															
12th	Southern Division	136	277	1	—	1	14	13·06	2036·8	7·35	102·94	96·03	35·15	17·26	Hong Kong, 12 months	2
35th	Southern Division	134	252	2	—	2	6	12·83	1880·6	14·93	44·78	95·75	35·04	18·63	Hong Kong, 12 months	2
	Total	270	529	3	—	3	20	25·89	1959·3	11·11	74·07	95·89	35·10	17·91		
	Royal Engineers	150	145	2	—	2	7	6·60	966·7	13·33	46·67	44·00	16·10	16·66	Hong Kong, 12 months	Various.

	Infantry Regiments.															
1st	West Yorkshire Regiment	122	289	—	—	—	—	11·93	2363·8	—	—	97·79	35·79	15·11	Hong Kong, 1½ months. From Gibraltar, 16th November.	—
1st	Rifle Brigade	880	1,733	6	—	6	63	83·07	1969·3	6·82	71·59	94·40	34·55	17·54	Hong Kong, 11 months. To Singapore, 23rd November.	2
	Total	1,002	2,022	6	—	6	63	95·00	2018·0	5·99	62·87	94·81	34·70	17·20		
	Garrison Staff and Departments.	48	33	—	—	—	—	1·24	687·5	—	—	25·83	9·45	13·75	Hong Kong, 12 months	Various.
	Grand total	1,470	2,729	11	—	11	90	128·73	1856·5	7·48	61·22	87·57	32·05	17·26		
	STRAITS SETTLEMENTS.															
	Royal Artillery.															
25th	Southern Division	135	110	1	1	2	2	7·84	814·8	14·81	14·81	58·07	21·25	26·09	Fort Canning and Blakan Mati, 12 months.	2
38th	Southern Division	130	155	—	—	—	2	9·54	1192·3	—	15·38	73·38	26·86	22·53	Fort Canning and Blakan Mati, 12 months.	1
	Total	265	265	1	1	2	4	17·38	1000·0	7·54	15·09	65·58	24·00	24·00		
	Royal Engineers	82	39	2	—	2	3	2·60	475·6	24·39	36·59	31·71	11·60	24·40	Pulo Brani, Fort Canning, and Tanglin, 12 months.	Various.
	Infantry Regiments.															
2nd	Northumberland Fusiliers	878	1,036	7	1	8	12	73·16	1179·9	9·11	13·67	83·33	30·50	25·85	Fort Canning, Tanglin, and Penang, 11 months. To England, 29th November.	—
1st	Rifle Brigade	90	102	—	—	—	1	4·19	1133·3	—	11·11	46·56	17·04	15·03	Fort Canning, Tanglin, and Penang, 1 month. From Hong Kong, 29th November.	—
	Total	968	1,138	7	1	8	13	77·35	1175·6	8·26	13·43	79·91	29·25	24·88		
	Garrison Staff and Departments.	87	11	—	—	—	—	·41	297·3	—	—	11·08	4·06	13·64	Fort Canning, Tanglin, and Penang, 12 months.	Various.
	Grand total	1,352	1,453	10	2	12	20	97·74	1074·7	8·88	14·79	72·29	26·46	24·62		

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
	EGYPT and CYPRUS.															
	Cavalry.															
2nd	Dragoon Guards - -	405	331	1	—	1	6	25·80	817·3	2·47	14·81	63·70	23·31	28·53	Abbassiyeh, 10 months. To England, 24th October 1896.	—
21st	Hussars - - - -	94	123	1	—	1	—	7·46	1308·5	10·64	—	79·36	29·05	22·20	Abbassiyeh, 2 months. From India, 23rd October 1896.	—
	Total - - -	499	454	2	—	2	6	33·26	909·8	4·01	12·02	66·65	24·39	26·81		
	Royal Artillery.															
32d	Field Battery - - -	174	110	2	—	2	4	10·49	632·2	11·49	22·99	60·29	22·07	34·90	Abbassiyeh, 12 months - -	3
16th	Eastern Division - -	145	127	1	—	1	1	7·26	875·9	6·90	6·90	50·07	18·33	20·92	Alexandria and Cairo, 12 months -	2
	Total - - -	319	237	3	—	3	5	17·75	742·9	9·40	15·67	55·64	20·36	27·41		
	Royal Engineers -	113	29	1	—	1	1	1·85	256·6	8·85	8·85	16·37	5·99	23·71	Alexandria, Cairo, and Cyprus, 12 months.	2
	Infantry Regiments.															
1st	Gloucestershire Regiment -	976	857	5	—	5	5	67·21	878·1	5·12	5·12	68·86	25·20	28·47	Abbassiyeh, Cairo, and Cyprus, 12 months.	1
1st	North Staffordshire Regiment	575	554	26	—	26	—	44·71	963·5	45·22	—	77·76	28·46	29·54	Cairo, 6 months. "Up Nile," 6 months.	1
2nd	Connaught Rangers - -	1,003	853	7	—	7	9	63·44	850·4	6·98	8·97	63·25	23·15	27·22	Cairo, 12 months - - -	1

Mounted Infantry	108	102	2	—	2	—	5·68	944·4	18·52	—	52·59	19·25	20·38	Abbassiyeh, 12 months	Various.
Other Corps	22	20	3	—	3	9	6·16	909·1	136·36	409·09	318·91	—	—	Details left behind on embarkation of the Battalions.	„
Total	2,684	2,386	43	—	43	23	187·20	888·9	16·02	8·57	69·74	—	—		
Garrison Staff and Departments.															
Army Service Corps	61	26	—	—	—	—	1·46	426·2	—	—	23·93	8·76	20·55	Various stations, 12 months	Various.
Medical Staff Corps	106	54	1	—	1	—	2·43	509·4	9·43	—	22·58	8·37	16·47	„ „	„
Army Ordnance Corps	56	12	1	—	1	1	·84	214·3	17·86	17·86	15·00	5·49	25·02	Various stations, 12 months	„
Army Pay Corps	9	1	—	—	—	—	·02	111·1	—	—	2·22	·81	7·32	„ „	„
Military Police	64	19	1	—	1	—	2·31	296·9	15·63	—	36·09	13·21	44·49	„ „	„
General Staff	5	2	—	—	—	—	·11	400·0	—	—	22·00	8·05	20·13	„ „	„
Total	301	114	3	—	3	1	7·17	378·7	6·64	3·32	23·82	8·72	23·02		
Grand Total	3,916	3,220	52	—	52	36	247·23	822·3	13·28	9·19	63·13	23·11	28·10		

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
	WEST INDIES—*cont.*												days.	days.		
	(JAMAICA.)															
	Royal Artillery.															
14th	Western Division	130	152	2	—	2	1	8·60	1169·2	15·38	7·69	66·15	24·21	20·71	Detachments at all stations, 12 months	2
	Jamaica Company	4	1	—	—	—	—	·04	250·0	—	—	10·00	3·66	14·64	Port Royal, 12 months	—
	Total	134	153	2	—	2	1	8·64	1141·8	14·93	7·46	64·48	23·60	20·67		
	Royal Engineers	42	12	—	—	—	—	·70	285·7	—	—	16·67	6·10	21·35	Detachments at all stations, 12 months	Various.
	Infantry Regiments.															
1st	Liverpool Regiment	298	241	1	—	1	3	19·38	808·7	3·36	10·97	65·03	23·80	29·43	Newcastle and Up Park Camp, 12 months.	3
	Other Corps	2	1	1	—	1	2	·46	500·0	500·00	500·00	230·00	84·18	168·36	- - - - - -	—
	West India Regiment	17	7	—	—	—	—	·44	470·6	—	—	25·88	9·47	20·11	Up Park Camp, 12 months	2
	Total	317	249	2	—	2	5	20·28	785·5	6·31	15·97	63·97	23·41	29·30		
	Garrison Staff and Departments.	34	17	1	—	1	—	1·19	500·0	29·41	—	35·00	12·81	25·63	Various stations	Various.
	Total Jamaica	527	431	5	—	5	6	30·81	817·8	9·49	11·39	58·45	21·39	26·16		
	Grand Total, West Indies	1,293	1,539	8	—	8	26	101·37	1190·2	6·19	20·11	78·40	28·69	24·11		

	SOUTH AFRICA AND ST. HELENA.															
	Cavalry.															
7th	Hussars - - - -	314	285	6	—	6	5	17·19	907·6	19·11	15·92	54·75	20·04	22·08	Pietermaritzburg, 12 months - -	1
9th	Lancers - - - -	151	152	—	—	—	—	7·96	1006·6	—	—	52·72	19·29	19·17	Pietermaritzburg, 3 months. From England, 22nd September.	—
	Total - -	465	437	6	—	6	5	25·15	939·8	12·90	10·75	54·09	19·80	21·06		
	Royal Artillery.															
10th	Mountain Battery - -	157	187	3	—	3	3	14·03	1191·1	19·11	19·11	89·36	32·71	27·46	Pietermaritzburg, 12 months - -	3
25th	Western Division - -	145	133	—	—	—	6	10·22	917·2	—	44·33	70·48	25·80	28·12	Cape Town, Wynberg, and Simonstown, 12 months.	2
26th	Western Division - -	112	115	2	—	2	3	8·35	1026·8	17·86	26·79	74·55	27·29	26·57	Cape Town, Wynberg, and Simonstown, 12 months.	1
	St. Helena Detachment -	90	56	—	—	—	1	2·95	622·2	—	11·11	32·78	12·00	19·28	St. Helena, 12 months - -	7
	District Establishment -	50	12	—	—	—	—	·73	240·0	—	—	14·60	5·34	22·27	Cape Town and Simonstown, 12 months.	Various.
	Total - -	554	503	5	—	5	13	36·28	907·9	9·03	23·47	65·49	23·97	26·40		
	Royal Engineers.	94	30	—	—	—	*2	2·23	319·1	—	21·28	23·72	8·68	27·21	Cape Town, Simonstown, Wynberg, and St. Helena, 12 months.	10
	Infantry Regiments.															
1st	Leicestershire Regiment -	949	768	2	—	2	14	44·93	809·3	2·11	14·75	47·34	17·33	21·41	Wynberg, 11 months. From Barbados, 18th January.	11
2nd	West Riding Regiment -	774	709	4	—	4	15	43·24	916·0	5·17	19·38	55·87	20·45	22·32	Pietermaritzburg and Eshowe, 12 months.	3
1st	Royal Highlanders - -	27	46	—	—	—	3	3·90	1703·7	—	111·11	144·44	52·87	31·03	Cape Town, 25 days. To India, 25th January.	—
1st	Middlesex Regiment - -	382	396	1	—	1	1	22·43	1036·6	2·62	2·62	58·69	21·48	20·72	Cape Town and Wynberg, 7 months. From England, 18th May.	—
2nd	King's Royal Rifle Corps -	370	240	2	—	2	3	19·55	648·6	5·41	8·11	52·84	19·34	29·81	Cape Town and Wynberg, 4 months. From Malta, 5th August.	—

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
													days.	days.		
	South Africa and St. Helena—*cont.*															
	Infantry Regiments—cont.															
2nd	York and Lancaster Regiment	454	474	1	—	1	6	31·60	1044·1	2·20	13·22	69·60	25·47	24·40	Wynberg and Pietermaritzburg, 12 months.	5
	Mounted Infantry - -	151	138	—	—	—	2	6·86	913·9	—	13·25	45·43	16·63	18·19	Wynberg, 2 months. Pietermaritzburg, 6 months. From England, 18th May.	—
	Other Corps - - -	1	2	—	—	—	—	·14	—	—	—	—	—	—	- - - - - -	—
	Total - -	3,108	2,773	10	—	10	44	172·64	892·2	3·22	14·16	55·55	20·33	22·79		
	Garrison Staff and Departments.															
	Army Service Corps - -	38	12	—	—	—	—	·52	315·8	—	—	13·68	5·01	15·86	Various stations - - -	Various.
	Medical Staff Corps - -	78	34	—	—	—	—	2·14	435·9	—	—	27·44	10·04	23·04	" - - -	"
	Army Ordnance Corps -	43	16	—	—	—	1	·88	372·1	—	23·26	20·47	7·49	20·13	" - - -	"
	Other Staff and Departmental Corps.	32	5	—	—	—	—	·27	156·3	—	—	8·44	3·09	19·76	" - - -	"
	Total - - -	101	67	—	—	—	1	3·81	350·8	—	5·23	19·95	7·30	20·81		
	Grand Total - -	4,412	3,810	21	—	21	*65	240·11	863·5	4·76	14·73	54·42	19·92	23·07		

* Includes 1 man discharged in the Command.

	MAURITIUS.															
	Royal Artillery.															
24th	Western Division	134	251	2	—	2	20	18·12	1873·1	14·93	149·25	135·22	49·49	26·42	Curepipe and Port Louis, 12 months	2
	District Staff, &c.	10	9	—	—	—	1	·75	900·0	—	100·0	75·00	27·45	30·50	Port Louis, 12 months	—
	Total	144	260	2	—	2	21	18·87	1805·6	13·89	145·83	131·04	47·96	26·56		
	Royal Engineers	36	35	—	—	—	3	1·44	972·2	—	83·33	40·00	14·64	15·06	Port Louis and Curepipe	—
	Infantry Regiments.															
1st	Royal Highlanders	56	55	—	—	—	1	4·27	982·1	—	17·86	76·25	27·91	28·42	Curepipe and Port Louis, 1 month. To India, 6th February.	—
2nd	York and Lancaster Regiment	421	439	4	—	4	8	30·61	1042·8	9·50	19·00	72·66	26·59	25·49	Curepipe and Port Louis, 11 months. From South Africa, 6th February.	—
	Total	477	494	4	—	4	9	34·88	1035·6	8·39	18·87	73·12	26·76	25·84		
	Garrison Staff and Departments.	19	10	—	—	—	1	·71	526·3	—	52·63	37·36	13·67	25·97	Curepipe and Port Louis, 12 months	Various.
	Grand Total	676	799	6	—	6	34	55·90	1181·9	8·88	50·30	82·69	30·26	25·60		
	CEYLON.															
	Royal Artillery.															
6th	Southern Division	129	85	1	—	1	1	4·95	658·9	7·75	7·75	38·37	14·04	21·31	Colombo, 11 months; Trincomali, 1 month.	1
37th	Southern Division	124	101	3	—	3	3	5·18	814·5	24·19	24·19	41·77	15·29	18·77	Trincomali, 11 months; Colombo, 1 month.	1
		253	186	4	—	4	4	10·13	735·2	15·81	15·81	40·04	14·65	19·93		
	Royal Engineers	85	48	—	—	—	—	1·72	564·7	—	—	20·24	7·41	13·12	Colombo and Trincomali, 12 months	Various.

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
	CEYLON—*cont.*												days.	days.		
	Infantry Regiments.															
2nd	Royal Warwickshire Regiment.	141	127	1	—	1	2	6·27	900·7	7·09	14·18	44·47	16·28	18·07	Colombo, 2 months. To England, 25th February.	—
1st	Loyal North Lancashire Regiment.	819	1,389	6	—	6	24	68·16	1696·0	7·33	29·30	83·22	30·46	17·96	Colombo, 10 months. From India, 24th February.	—
	Other Corps	—	1	—	—	—	—	·04	—	—	—	—	—	—	. . . .	—
	Total	960	1,517	7	—	7	26	74·47	1580·2	7·29	27·08	77·57	28·39	17·97		
	Garrison Staff and Departments.	38	14	—	—	—	1	·40	368·4	—	26·32	10·53	3·85	10·46	Various stations	Various.
	Grand Total	1,336	1,765	11	—	11	31	86·72	1321·1	8·23	23·20	64·91	23·76	17·98		
	CHINA.															
	Royal Artillery.															
12th	Southern Division	136	277	1	—	1	14	13·06	2036·8	7·35	102·94	96·03	35·15	17·26	Hong Kong, 12 months	2
35th	Southern Division	134	252	2	—	2	6	12·83	1880·6	14·93	44·78	95·75	35·04	18·63	Hong Kong, 12 months	2
	Total	270	529	3	—	3	20	25·89	1959·3	11·11	74·07	95·89	35·10	17·91		
	Royal Engineers	150	145	2	—	2	7	6·60	966·7	13·33	46·67	44·00	16·10	16·66	Hong Kong, 12 months	Various.

	Infantry Regiments.															
1st	West Yorkshire Regiment	122	289	—	—	—	—	11·93	2368·8	—	—	97·79	35·79	15·11	Hong Kong, 1½ months. From Gibraltar, 16th November.	—
1st	Rifle Brigade	880	1,733	6	—	6	63	83·07	1969·3	6·82	71·59	94·40	34·55	17·54	Hong Kong, 11 months. To Singapore, 23rd November.	2
	Total	1,002	2,022	6	—	6	63	95·00	2018·0	5·99	62·87	94·81	34·70	17·20		
	Garrison Staff and Departments.	48	33	—	—	—	—	1·24	687·5	—	—	25·83	9·45	13·75	Hong Kong, 12 months	Various.
	Grand total	1,470	2,729	11	—	11	90	128·73	1856·5	7·48	61·22	87·57	32·05	17·26		
	STRAITS SETTLEMENTS.															
	Royal Artillery.															
25th	Southern Division	135	110	1	1	2	2	7·84	814·8	14·81	14·81	58·07	21·25	26·09	Fort Canning and Blakan Mati, 12 months.	2
38th	Southern Division	130	155	—	—	—	2	9·54	1192·3	—	15·38	73·38	26·86	22·53	Fort Canning and Blakan Mati, 12 months.	1
	Total	265	265	1	1	2	4	17·38	1000·0	7·54	15·09	65·58	24·00	24·00		
	Royal Engineers	82	39	2	—	2	3	2·60	475·6	24·39	36·59	31·71	11·60	24·40	Pulo Brani, Fort Canning, and Tanglin, 12 months.	Various.
	Infantry Regiments.															
2nd	Northumberland Fusiliers	878	1,036	7	1	8	12	73·16	1179·9	9·11	13·67	83·33	30·50	25·85	Fort Canning, Tanglin, and Penang, 11 months. To England, 29th November.	—
1st	Rifle Brigade	90	102	—	—	—	1	4·19	1133·3	—	11·11	46·56	17·04	15·03	Fort Canning, Tanglin, and Penang, 1 month. From Hong Kong, 29th November.	—
	Total	968	1,138	7	1	8	13	77·35	1175·6	8·26	13·43	79·91	29·25	24·88		
	Garrison Staff and Departments.	87	11	—	—	—	—	·41	297·3	—	—	11·08	4·06	13·64	Fort Canning, Tanglin, and Penang, 12 months.	Various.
	Grand total	1,352	1,453	10	2	12	20	97·74	1074·7	8·88	14·79	72·29	26·46	24·62		

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in Command.
				In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.				
	EGYPT and CYPRUS.															
	Cavalry.															
2nd	Dragoon Guards - -	405	331	1	—	1	6	25·80	817·3	2·47	14·81	63·70	23·31	28·53	Abbassiyeh, 10 months. To England, 24th October 1896.	—
21st	Hussars - - - -	94	123	1	—	1	—	7·46	1308·5	10·64	—	79·36	29·05	22·20	Abbassiyeh, 2 months. From India, 23rd October 1896.	—
	Total - - -	499	454	2	—	2	6	33·26	909·8	4·01	12·02	66·65	24·39	26·81		
	Royal Artillery.															
32d	Field Battery - - -	174	110	2	—	2	4	10·49	632·2	11·49	22·99	60·29	22·07	34·90	Abbassiyeh, 12 months - -	3
16th	Eastern Division - -	145	127	1	—	1	1	7·26	875·9	6·90	6·90	50·07	18·33	20·92	Alexandria and Cairo, 12 months -	2
	Total - - -	319	237	3	—	3	5	17·75	742·9	9·40	15·67	55·64	20·36	27·41		
	Royal Engineers -	113	29	1	—	1	1	1·85	256·6	8·85	8·85	16·37	5·99	23·71	Alexandria, Cairo, and Cyprus, 12 months.	2
	Infantry Regiments.															
1st	Gloucestershire Regiment -	976	857	5	—	5	5	67·21	878·1	5·12	5·12	68·86	25·20	28·47	Abbassiyeh, Cairo, and Cyprus, 12 months.	1
1st	North Staffordshire Regiment	575	554	26	—	26	—	44·71	963·5	45·22	—	77·76	28·46	29·54	Cairo, 6 months. "Up Nile," 6 months.	1
2nd	Connaught Rangers - -	1,003	853	7	—	7	9	63·44	850·4	6·98	8·97	63·25	23·15	27·22	Cairo, 12 months - - -	1

Mounted Infantry - -	108	102	2	—	2	—	5·68	944·4	18·52	—	52·59	19·25	20·38	Abbassiyeh, 12 months - -	Various.
Other Corps - - -	22	20	3	—	3	9	6·16	909·1	136·36	409·09	318·91	—	—	Details left behind on embarkation of the Battalions.	„
Total - - -	2,684	2,386	43	—	43	23	187·20	888·9	16·02	8·57	69·74	—	—		
Garrison Staff and Departments.															
Army Service Corps - -	61	26	—	—	—	—	1·46	426·2	—	—	23·93	8·76	20·55	Various stations, 12 months - -	Various.
Medical Staff Corps - -	106	54	1	—	1	—	2·43	509·4	9·43	—	22·58	8·37	16·47	„ „ - -	„
Army Ordnance Corps -	56	12	1	—	1	1	·84	214·3	17·86	17·86	15·00	5·49	25·62	Various stations, 12 months - -	„
Army Pay Corps - -	9	1	—	—	—	—	·02	111·1	—	—	2·22	·81	7·32	„ „ - -	„
Military Police - - -	64	19	1	—	1	—	2·31	296·9	15·63	—	36·09	13·21	44·49	„ „ - -	„
General Staff - - -	5	2	—	—	—	—	·11	400·0	—	—	22·00	8·05	20·13	„ „ - -	„
Total - - -	301	114	3	—	3	1	7·17	378·7	6·64	3·32	23·82	8·72	23·02		
Grand Total -	3,916	3,220	52	—	52	36	247·23	822·3	13·28	9·19	63·13	23·11	28·10		

ABSTRACT No. XXVI.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the ADMISSIONS, MORTALITY, and INVALIDING in each CORPS serving in INDIA during the Year 1896.

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Constantly Sick.				
CAVALRY.										days.	days.		Yrs. ms.
4th Dragoon Guards - -	605	854	16	6	49·54	1411·6	26·45	9·92	81·88	29·97	21·23	Rawal Pindi, 12 months; Dett. Topa, 6 months -	2 3
5th " " - -	568	703	7	15	50·96	1237·7	12·32	26·41	89·72	32·83	26·53	Meerut, 12 months - - - - -	3 2½
4th Hussars - - -	115	216	2	—	11·84	1878·3	17·39	—	102·96	37·68	20·06	Bangalore, 2¾ months (arrived from England on 8th October 1896).	0 3
5th Lancers - - -	604	844	8	8	52·29	1397·4	13·25	13·25	86·57	31·60	22·68	Muttra, 12 months - - - - -	8 0
11th Hussars - - -	650	506	5	13	32·35	778·5	7·69	20·00	49·77	18·22	23·40	Sialkot, 12 months - - - - -	4 1
16th Lancers - - -	586	785	11	29	56·62	1339·6	18·77	49·49	96·62	35·36	26·40	Lucknow, 10 months; Umballa, ½ month; marching, 1½ months.	6 3
18th Hussars - - -	625	747	11	10	43·66	1195·2	17·60	16·00	69·86	25·57	21·39	Umballa, 11½ months; Lucknow, ¼ month; marching, ¼ month.	7 0
19th " - - -	580	595	6	19	45·37	1025·9	10·34	32·76	78·22	28·63	27·91	Bangalore, 9¼ months; Secunderabad, 2¾ months	5 3
20th " - - -	598	759	5	12	59·36	1269·2	8·36	20·06	99·26	36·33	28·62	Mhow, 12 months - - - - -	1 3
21st " - - -	471	612	5	12	45·02	1299·4	10·62	25·48	95·58	34·98	26·92	Secunderabad, 9 months (left for Egypt on 2nd October 1896).	8 9
Total - - -	5,402	6,621	76	124	447·01	1225·7	14·07	22·95	82·75	30·29	24·71		

ARTILLERY.														
A Battery, R.H.A. - -	143	177	3	6	10·58	1237·8	20·98	41·96	73·99	27·08	21·88	Umballa, 11 months; marching, 1 month - -	7	2
B " " - -	155	164	1	1	8·85	1058·1	6·45	6·45	57·10	20·90	19·75	Rawal Pindi, 10 months; marching, 2 months .	7	2
C " " - -	143	184	2	6	13·18	1295·8	14·08	42·25	92·82	33·97	26·22	Meerut, 11 months; marching, 1 month - -	7	2
F " " - -	161	169	4	—	10·75	1049·7	24·84	—	66·77	24·44	23·28	Sialkot, 12 months; Dett. Topa, 5 months - -	1	3
H " " - -	154	210	—	6	13·80	1363·6	—	38·96	89·61	32·30	24·05	Umballa, 11 months; marching, 1 month - -	7	2
I " " - -	148	175	2	3	11·66	1182·4	13·51	20·27	78·78	28·83	24·39	Mhow, 12 months - - - - -	3	2½
K " " - -	147	211	2	5	11·41	1435·4	13·61	34·01	77·62	28·41	19·79	Lucknow, 11½ months; marching, ½ month -	5	2
L " " - -	161	148	1	5	10·94	919·3	6·21	31·06	67·95	24·87	27·05	Kirkee, 12 months - - - - -	4	2
M " " - -	172	162	6	7	14·16	941·9	34·88	40·70	82·33	30·13	31·99	Bangalore, 12 months - - - - .	10	0
N " " - -	160	172	3	6	12·81	1075·0	18·75	37·50	80·06	29·30	27·26	Meerut, 11 months; marching, 1 month - -	11	1½
S " " - -	152	184	1	4	12·95	1210·5	6·58	26·32	85·20	31·18	25·76	Secunderabad, 12 months - - - -	11	0
1st Field Battery, R.A. -	133	244	9	1	15·01	1834·6	67·67	7·52	112·86	41·31	22·52	Kirkee, 11⅚ months (arrived from England on 6th January 1896).	1	0
2nd " " -	115	96	1	4	8·15	834·8	8·70	34·78	70·87	25·94	31·07	Dinapore, 9 months (left for England on 29th September 1896).	15	8½
3rd " " -	39	113	—	—	4·09	2897·4	—	—	104·87	38·38	13·25	Saugor, 2¾ months (arrived from England on 8th October 1896).	0	3
5th " " -	160	122	1	3	9·66	762·5	6·25	18·75	60·38	22·10	28·98	Bangalore, 12 months - - - - -	13	0
6th " " -	168	246	4	3	13·83	1464·3	23·81	17·86	82·32	30·13	20·58	Saugor, 9¾ months; Dinapore, 2¼ months - -	5	2
8th " " -	122	237	4	5	17·95	1942·6	32·79	40·98	147·13	53·85	27·72	Jhansi, 10 months (left for England on 28th October 1896).	15	9½
9th " " -	147	195	—	2	12·25	1326·5	—	13·61	83·33	30·50	22·99	Mian Mir, 11½ months; Practice camp, Muridki, ½ month.	13	2
10th " " -	150	196	3	4	13·95	1306·7	20·00	26·67	93·00	34·04	26·05	Rawal Pindi, 11½ months; Campbellpore, ¼ month; marching, ¼ month.	12	2
15th " " -	144	129	1	3	7·75	895·8	6·94	20·83	53·82	19·70	21·99	Campbellpore, 10½ months; Rawal Pindi, ½ month; marching, 1 month.	9	0
16th " " -	137	197	5	3	14·25	1438·0	36·50	21·90	104·01	38·07	26·47	Kirkee, 10¾ months (arrived from England on 7th February 1896).	0	11
17th " " -	157	223	5	3	15·10	1420·4	31·85	19·11	96·18	35·20	24·78	Jubbulpore, 11 months; Practice camp, Dhana, 1 month.	13	2

Corps.		Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.	
							Admissions into Hospital.	Deaths.	Invalids.	Constantly Sick.					
ARTILLERY—*cont.*											days.	days.		Yrs.	ms.
21st Field Battery, R.A.	-	148	186	—	7	13·65	1256·8	—	47·30	92·23	33·76	26·86	Bangalore, 12 months - - - - -	11	0
22nd " "	-	164	286	2	4	19·30	1743·9	12·20	24·39	117·68	43·07	24·70	Mhow, 11⅔ months; Practice camp, Badanawar, ⅓ month.	10	0
23rd " "	-	166	182	1	6	9·68	1096·4	6·02	36·14	58·31	21·34	19·47	St. Thomas' Mount, 12 months - - -	5	2
24th " "	-	156	237	3	8	17·02	1519·2	10·23	51·28	100·10	39·93	26·28	Agra, 11 months; marching, 1 month - -	6	2
26th " "	-	149	126	1	2	7·55	845·6	6·71	13·42	50·67	18·55	21·93	Kamptee, 12 months - - - - -	13	2
27th " "	-	127	181	2	4	11·92	1425·2	15·75	31·50	93·86	34·35	24·10	Kirkee, ½ month; Nasirabad, 10½ months; marching, ¼ month.	9	2
29th " "	-	159	179	2	7	12·48	1125·8	12·58	44·03	78·49	28·73	25·52	Belgaum, 12 months - - - - -	3	2
30th " "	-	29	43	—	—	1·77	1482·8	—	—	61·03	22·34	15·07	Fyzabad, 2⅓ months (arrived from England on 26th October 1896).	0	2
31st " "	-	147	246	2	7	15·27	1673·5	13·61	47·62	103·88	38·02	22·72	Mian Mir, 12 months - - - - -	8	2
33rd " "	-	151	148	1	3	13·80	980·1	6·62	19·87	91·39	33·45	34·13	Secunderabad, 12 months - - - -	5	2
34th " "	-	152	168	1	3	13·05	1105·3	6·58	19·74	85·86	31·42	28·43	Meerut, 11 months; marching, 1 month - -	6	2
35th " "	-	144	258	1	8	15·89	1791·7	6·94	55·56	110·35	40·39	22·54	Deesa, 12 months - - - - -	8	2
36th " "	-	138	321	3	4	18·41	2326·1	21·74	28·99	133·41	48·83	20·99	Kirkee, ¼ month; Neemuch, 10¾ months; marching, 1 month.	9	2
59th " "	-	129	221	4	5	15·93	1713·2	31·01	38·76	123·40	45·20	26·38	Fyzabad, 10⅓ months (left for England on 11th November 1896).	15	10
40th " "	-	144	129	1	4	7·95	805·8	6·94	27·78	55·21	20·21	22·56	Kirkee, ¼ month; Ahmednagar, 11½ months; marching, ¼ month.	3	2¼
41st " "	-	148	312	4	5	16·50	2103·1	27·03	33·78	112·09	41·03	19·46	Barrackpore, 12 months; Dett. Calcutta, 1¼ months.	1	2¼

42nd Field Battery, R.A.	151	138	—	5	12·48	913·9	—	33·11	82·35	30·25	33·10	Secunderabad, 12 months	10	0
44th „ „	15	8	—	4	·07	533·3	—	266·67	4·67	1·71	3·20	Mhow, 2 days; Kirkee, 5 days; marching, 1 month 3 days (left for England on 11th February 1896).	5	1½
45th „ „	158	193	—	9	13·21	1221·5	—	56·96	83·61	30·60	25·05	Bellary, 12 months	3	2
46th „ „	152	273	3	9	15·79	1796·1	19·74	59·21	103·88	38·02	21·17	Cawnpore, 10¾ months; marching, 1¼ months	6	2
47th „ „	156	220	1	6	13·91	1410·3	6·41	38·46	89·17	32·63	23·14	Karachi, 1¼ months; Hyderabad, 10¼ months; marching, ½ month.	5	1
48th „ „	149	185	3	7	11·49	1241·6	20·13	46·98	77·11	28·22	22·73	Bareilly, 10¾ months; marching, 1¼ months	9	2
49th „ „	146	179	2	2	8·61	1226·0	13·70	13·70	58·97	21·58	17·60	St. Thomas' Mount, 12 months	5	2
50th „ „	151	187	1	10	13·24	1238·4	6·62	66·23	87·68	32·09	25·91	Jullundur, 10¾ months; Practice camps, Muridki and Khana, 1¼ months.	10	0
51st „ „	158	167	4	4	10·64	1057·0	25·32	25·32	67·34	24·65	23·32	Meerut, 11 months; marching, 1 month	6	2
53rd „ „	161	391	1	—	17·03	2428·6	6·21	—	105·78	38·71	15·94	Karachi, 12 months	10	10½
54th „ „	151	208	1	1	14·10	1377·5	6·62	6·62	93·38	34·18	24·81	Allahabad, 12 months	6	2
55th „ „	145	474	8	12	23·43	3269·0	55·17	82·76	161·59	59·14	18·09	Ahmedabad, 9¼ months; Practice camp, Kharagoda, ¾ month; marching, 2 months.	8	2
57th „ „	15	15	—	—	·71	1000·0	—	—	47·33	17·32	17·32	Campbellpore, 1 month (arrived from England on 27th November 1896).	0	1
59th „ „	150	314	—	3	19·60	2093·3	—	20·00	130·67	47·82	22·85	Nowgong, 11 months; Practice camp, Dhana, 1 month.	12	2
60th „ „	158	234	4	1	15·75	1481·0	25·32	6·33	99·68	36·48	24·64	Multan, 12 months	10	0
65th „ „	15	8	—	1	·20	533·3	—	66·67	13·33	4·88	9·15	Mhow, 2 days; Kirkee, 5 days; marching, 1 month 3 days (left for England on 11th February 1896).	15	1½
68th „ „	124	220	1	5	12·32	1774·2	8·06	40·32	99·35	36·36	20·50	Peshawar, 10 months; Campbellpore, 3 days; marching, 3 days (left for England on 6th November 1896).	15	9½
70th „ „	146	196	1	4	12·01	1342·5	6·85	27·40	82·26	30·11	22·43	Lucknow, 12 months	10	1½
71st „ „	146	146	1	4	7·60	1000·0	6·85	27·40	52·05	19·05	19·05	Ferozepore, 11 months; Practice camp, Muridki, 1 month.	9	0
72nd „ „	138	204	8	1	13·48	1478·3	57·97	7·25	97·68	35·75	24·18	Kirkee, 12 months	8	2
80th „ „	18	52	2	—	2·12	2888·9	111·11	—	117·78	43·11	14·92	Jhansi, 1¼ months (arrived from England on 19th November 1896).	0	1½

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Constantly Sick.				
ARTILLERY—*cont.*										days.	days.		Yrs. ms.
No. 1 Mountain Battery, R.A.	96	129	—	1	7·81	1343·7	—	10·42	81·35	29·78	22·16	Umballa, 1½ months; Jutogh, 8½ months; marching, 2 months.	13 2
„ 2 „ „ „	100	138	4	2	9·59	1380·0	40·00	20·00	95·90	35·10	25·43	Quetta, 10½ months; marching, 1½ months	10 11
„ 3 „ „ „	99	87	—	6	5·64	878·8	—	60·61	56·97	20·85	23·73	Rawal Pindi, ½ month; Umballa, ¼ month; Jutogh, 9¾ months; marching, 1½ months.	18 1
„ 5 „ „ „	103	116	1	1	6·94	1126·2	9·71	9·71	67·38	24·66	21·90	Quetta, 1½ months; Rawal Pindi, 3½ months; Bara Gali, 6 months; marching, 1 month.	18 1
„ 6 „ „ „	83	157	2	4	11·98	1891·6	24·10	48·19	144·34	52·83	27·93	Mandalay, 10 months; Practice camp, Maymyo, 2 months.	11 2
„ 7 „ „ „	109	149	1	1	7·99	1367·0	9·17	9·17	73·30	26·83	19·63	Rawal Pindi, 6 months; Khyra Gali, 6 months	10 10
„ 8 „ „ „	99	116	1	2	6·06	1171·7	10·10	20·20	61·21	22·40	19·12	Rawal Pindi, 5½ months; Kalabagh, 6 months; marching, ½ month.	9 2
„ 9 „ „ „	98	72	2	—	4·35	734·7	20·41	—	44·39	16·25	22·11	Darjeeling, 9¾ months; Camps, Bagdogra and Guntock, 2¼ months.	12 3
No. 1 Co., Eastern Div., R.A.	132	274	6	6	15·32	2075·8	45·45	45·45	116·06	42·48	20·46	Bombay, 2¼ months; Delhi, 7¾ months; Calcutta, ½ month; Fort Fulta, 1¼ months; marching by rail, ¼ month.	8 0
„ 3 „ „	140	105	—	2	6·64	750·0	—	14·29	47·43	17·36	23·15	Bombay, 12 months	2 2
„ 4 „ „	132	147	—	5	3·90	1113·6	—	37·88	29·55	10·81	9·71	Madras, 12 months	8 0
„ 8 „ „	113	122	—	8	6·93	1079·6	—	70·80	61·33	22·45	20·79	Fort Fulta, 1¾ months; Calcutta, 8¼ months; Delhi, 2 months.	9 2
„ 9 „ „	139	244	2	—	11·16	1755·4	14·39	—	80·29	29·39	16·74	Fort Allahabad, 10½ months; Fort Chingrikhal, 1½ months.	1 0
„ 12 „ „	86	92	1	1	6·62	1069·8	11·63	11·63	76·98	28·17	26·34	Campbellpore, 12 months; Dott. Thobba, 6 months.	3 0
„ 13 „ „	119	240	5	3	10·84	2016·8	42·02	25·21	91·09	33·84	16·53	Fort Chingrikhal, 1½ months; Barrackpore, 9¾ months; Aden, ½ month; marching by rail, ¼ month.	10 1½

No. 24 Co., Eastern Div., R.A. -	130	112	—	4	7·54	861·5	—	30·77	58·00	21·23	24·64	Bombay, 12 months - - - - - -	2	0
„ 26 „ „ -	136	103	2	—	10·38	1198·5	14·71	—	76·32	27·93	23·31	Roorkee, 11 months; Practice camp, Pur, 1 month.	2	2
No. 3 Co., Southern Div., R.A.	128	115	1	3	5·64	898·4	7·81	23·44	44·06	16·13	17·95	Aden, 11½ months (left for England on 17th December 1896).	15	1½
„ 5 „ „ -	120	174	5	6	10·97	1450·0	41·67	50·00	91·42	33·46	23·07	Rawal Pindi, 10 months; Agra, 2 months - -	9	2
„ 7 „ „ -	131	169	6	3	15·77	1290·1	45·80	22·90	120·38	44·06	34·15	Quetta, 12 months - - - - - -	11	1½
„ 9 „ „ -	131	139	2	4	8·67	1061·1	15·27	30·53	66·18	24·22	22·83	Aden, 12 months - - - - - -	9	2
„ 11 „ „ -	133	153	—	9	15·78	1150·4	—	67·67	118·65	45·42	37·75	Rangoon, 12 months - - - - - -	7	1½
„ 18 „ „ -	128	143	1	4	9·23	1117·2	7·81	31·25	72·11	26·39	23·62	Ferozepore, 11 months; Karachi, 1 month; Dett. Amritsar, 12 months.	7	1½
„ 21 „ „ -	128	84	—	7	5·58	656·3	—	54·69	43·59	15·96	24·31	Aden, 12 months - - - - - -	7	1½
„ 23 „ „ -	133	127	2	3	7·10	954·9	15·04	22·56	53·38	19·54	20·46	Bombay, 12 months - - - - - -	2	3
„ 24 „ „ -	89	162	2	4	10·82	1820·2	22·47	44·94	121·57	44·50	24·45	Multan, 12 months - - - - - -	9	2
„ 23 „ „ -	142	180	1	3	18·85	1267·6	7·04	21·13	132·75	48·59	38·33	Quetta, 12 months - - - - - -	13	2
„ 33 „ „ -	7	15	1	—	·32	2142·9	142·86	—	45·71	16·73	7 81	Rawal Pindi, ½ month (arrived from England on 12th December 1896).	0	0½
No. 4 Co., Western Div., R.A.	119	168	1	5	12·52	1411·8	8·40	42·02	105·21	38·51	27·28	Roorkee, 11½ months; Camp Pur, ½ month -	2	2
„ 5 „ „ -	143	200	1	7	10·48	1398·6	6·99	48·95	73·29	26·82	19·18	Fort Attock, 5¼ months; Rawal Pindi, ¼ month; Thobba, 6½ months; Dett. Fort Attock, 6 months.	4	2
„ 7 „ „ -	95	88	—	5	8·74	926·3	—	52·63	92·00	33·67	36·35	Secunderabad, 12 months - - - - -	2	2
„ 9 „ „ -	89	132	—	3	10·64	1483·1	—	33·71	119·55	43·76	29·50	Jhansi, 11½ months; Camp, Palipahari, ½ month -	2	2
„ 11 „ „ -	130	108	1	4	7·50	830·8	7·69	30·77	57·69	21·12	25·42	Karachi, 12 months - - - - - -	9	2
„ 16 „ „ -	115	166	6	5	11·64	1443·5	52·17	43·48	101·22	37·05	25·66	Bombay, 2½ months; Agra, 7½ months; Barrackpore, ½ month; Fort Chingrikhal, 1½ months.	9	2
„ 18 „ „ -	131	204	2	11	17·22	1557·3	15·27	83·97	131·45	48·11	30·89	Rangoon, 12 months - - - - - -	2	2
„ 22 „ -	135	175	2	4	13·69	1296·3	14·81	29·63	101·41	37·12	28·63	Roorkee, 11½ months; Camp Pur, ½ month -	11	2½
Total - -	12,162	16,354	188	381	1051·98	1344·7	15·46	31·33	86·50	31·66	23·54			

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Constantly Sick.				
ROYAL ENGINEERS.										days.	days.		Yrs. ms.
H Company, Royal Engineers	93	44	—	1	1·95	473·1	—	10·75	20·97	7·67	16·22	Calcutta, Fort Fulta, Allahabad, Roorkee, Bangalore, Kirkee, and Bombay.	20 0
INFANTRY.													
2nd Royal Scots	935	1,393	7	30	96·14	1489·8	7·49	32·09	102·82	37·63	25·26	Mandalay, 12 months	4 9
1st Royal West Surrey Regiment.	966	1,317	17	47	95·02	1363·4	17·60	48·65	98·36	36·00	26·41	Umballa, 4¼ months; Dagshai, 7¼ months; marching, ½ month: Dett. Dagshai, 5 months.	1 11
1st East Kent Regiment	931	1,337	19	26	80·36	1436·1	20·41	27·93	86·32	31·59	22·00	Peshawar, 12 months; Dett. Cherat, 5½ months	9 9
1st Royal Fusiliers	931	1,613	17	20	118·61	1732·5	18·26	21·48	127·40	46·63	26·91	Mhow, 12 months; Dett. Indore, 12 months	0 0
1st Norfolk Regiment	960	1,384	41	23	97·42	1441·7	42·71	23·96	101·48	37·14	25·76	Allahabad, 12 months; Dett. Fort Allahabad, 12 months.	7 10
1st Devonshire Regiment	1,007	925	17	31	59·38	918·6	16·88	30·78	58·97	21·58	23·50	Peshawar, 6 months; Cherat, 6 months; Dett. Peshawar, 6 months.	4 0
2nd Suffolk Regiment	949	1,512	13	41	105·32	1593·3	13·70	43·20	110·98	40·62	25·49	Rangoon, 12 months; Dett, Port Blair, 10 months	5 10
1st Somersetshire Light Infantry.	1,012	1,412	16	20	91·07	1395·3	15·81	19·76	89·99	32·94	23·61	Mian Mir, 12 months; Dett. Dalhousie, 12 months; Fort Lahore, 12 months.	3 0
1st East Yorkshire Regiment	992	1,171	6	17	78·69	1180·4	6·05	17·14	79·32	29·03	24·50	Belgaum, 12 months	1 1
1st Bedfordshire Regiment	932	1,556	14	23	101·11	1669·5	15·02	24·68	108·49	39·71	23·78	Umballa, 12 months; Wing, Solon, 6½ months; Dett. Dagshai, 6 months.	6 0
2nd Royal Irish Regiment	955	1,963	22	24	126·85	2055·5	23·04	25·13	132·80	48·42	23·56	Jubbulpore, 12 months; Dett. Saugor, 12 months	11 11
2nd Yorkshire Regiment	890	1,493	13	49	96·42	1677·5	14·61	55·06	108·34	39·65	23·64	Shwebo, ½ month; Bareilly, 2¾ months; Ranikhet, 8 months; marching, ¾ month.	6 11

2nd Lancashire Fusiliers	952	1,245	14	17	96·48	1307·8	14·71	17·86	101·34	37·09	28·36	Quetta, 12 months	15	2
1st Royal Scots Fusiliers	155	191	2	1	10·89	1232·3	12·90	6·45	70·26	25·71	20·87	Sialkot, 2 months (arrived from England on 26th October 1896).	0	2
2nd Royal Scots Fusiliers	806	796	8	14	52·15	987·6	9·93	17·37	64·70	23·68	23·98	Sialkot, 9¾ months (left for England on 25th October, 1896); Dett. Amritsar, 9¾ months; Ghora Dhaks, 5 months.	14	9
1st Cheshire Regiment	960	1,495	9	38	115·71	1557·3	9·38	39·58	120·53	44·11	28·33	Bellary, 10½ months; Secunderabad, 1½ months; Wing, Madras, 10½ months.	9	2
1st Royal Welsh Fusiliers	877	1,912	21	29	140·19	2180·2	23·95	33·07	159·85	58·51	26·84	Jhansi, 9¾ months; Aden, 2 months; marching by rail, ¼ month; Wing, Nowgong, 9½ months; Dett. Jhansi, 2½ months.	16	3¼
2nd King's Own Scottish Borderers.	942	1,270	11	19	84·76	1348·2	11·68	20·17	89·98	32·93	24·45	Rawal Pindi, 12 months; Wing, Thobba, 6¾ months.	6	11¼
1st Scottish Rifles	1,011	1,457	8	35	108·73	1441·1	7·91	34·62	107·55	39·36	27·31	Bareilly, 3½ months; Chaubuttia, 7½ months; Shahjahanpur, 1 month; marching, ½ month; Wing, Shahjahanpur, 11 months.	2	0
2nd Royal Inniskilling Fusiliers.	883	1,214	4	37	93·41	1374·9	4·53	41·90	105·79	38·72	28·16	Thayetmyo, 2½ months; Chakrata, 7 months; Meerut, 1½ months; marching, 1 month; Dett. Meiktila, 2½ months, Meerut, 3 months.	8	0
1st Worcestershire Regiment	516	676	5	31	36·57	1310·1	9·69	60·08	70·87	25·94	19·80	Aden, 10 months (left for England on 29th October 1896).	17	8
1st East Lancashire Regiment	898	1,439	5	43	105·61	1602·4	5·57	47·88	117·61	43·04	26·86	Lucknow, 1½ months; Thayetmyo, 9¾ months; marching by rail, ¾ month; Wing, Meiktila, 9½ months; Dett. Rangoon, ¼ month.	16	11
1st East Surrey Regiment	1,063	1,366	19	28	110·41	1285·0	17·87	26·34	103·87	38·02	29·58	Agra, 10 months; Jhansi, 2 months; Dett. Nowgong, 2½ month.	11	11½
1st Duke of Cornwall's Light Infantry.	956	1,478	24	21	106·17	1546·0	25·10	21·97	111·06	40·65	26·29	Meerut, 1¼ months; Lucknow, 9¾ months; marching, 1 month; Dett. Chakrata, 6 months.	8	10
2nd Border Regiment	954	1,369	11	24	110·35	1435·0	11·53	25·16	115·67	42·34	29·50	Multan, 2½ months; Quetta, 9½ months	6	10
2nd Royal Sussex Regiment	972	1,441	30	26	103·12	1482·5	30·86	26·75	106·09	38·83	26·19	Fyzabad, 12 months; Dett. Chakrata, 6 months	11	0
1st Hampshire Regiment	984	1,317	19	20	81·53	1338·4	19·31	20·33	82·86	30·33	22·66	Bareilly, 1½ months; Practice camp, Pur, 1 month; Multan, 9½ months; Dett. Dalhousie, 9½ months.	10	11
2nd South Staffordshire Regiment.	988	1,243	16	5	79·13	1258·1	16·19	5·06	80·09	29·31	23·30	Wellington, 12 months; Dett. Malapuram, 12 months; Cannanore, 12 months; Calicut, 12 months.	1	2
1st Dorsetshire Regiment	953	1,027	13	31	89·06	1077·6	13·64	32·53	93·45	34·20	31·74	Bangalore, 12 months	3	3
2nd South Lancashire Regiment.	921	1,055	14	22	70·90	1145·5	15·20	23·89	76·98	28·18	24·60	Kamptee, 12 months	1	10
2nd Welsh Regiment	921	1,686	12	69	132·21	1830·6	13·03	74·92	143·55	52·54	28·70	Secunderabad, 10½ months; Bellary, 1½ months: Dett. Madras, 1½ months; Wellington, 12 months.	4	3

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Constantly Sick.				
INFANTRY—*cont.*										days.	days.		Yrs. ms.
1st Royal Highlanders	769	1,275	26	16	77·41	1658·0	33·81	20·81	100·66	36·84	22·22	Umballa, 3 months; Subathu, 6¾ months; marching, ¼ month (arrived from Mauritius on 26th February 1896); Dett. Jutogh, 7¾ months; Subathu, 3 months.	0 10
2nd Oxfordshire Light Infantry	944	1,410	12	39	97·12	1493·6	12·71	41·31	102·88	37·65	25·21	Bareilly, 12 months; Dett. Ranikhet, 7 months	10 9
2nd Essex Regiment	982	1,065	20	33	87·45	1084·5	20·37	33·60	89·05	32·59	30·05	Lucknow, 12 months; Dett. Ranikhet, 7 months	4 2
2nd Derbyshire Regiment	921	1,360	28	32	82·52	1476·7	30·40	34·74	89·60	32·79	22·21	Sitapur, 12 months; Wing, Benares, 12 months; Dett. Ranikhet, 6¾ months.	14 2
1st Loyal North Lancashire Regiment.	113	127	1	18	9·13	1123·9	8·85	159·29	80·80	29·57	26·31	Poona, 1½ months (left for Ceylon on 17th February 1896).	12 0½
1st Northamptonshire Regiment.	1,017	1,189	11	15	84·42	1169·1	10·82	14·75	83·01	30·38	25·99	Secunderabad, 12 months; Dett. Wellington, 12 months.	4 2
1st Royal West Kent Regiment	945	1,577	13	22	100·30	1668·8	13·76	23·28	106·14	38·85	23·28	Meerut, 12 months; Dett. Delhi, 12 months; Chakrata, 6 months.	4 11
2nd King's Own Yorkshire Light Infantry.	986	1,894	24	18	107·10	1920·9	24·34	18·26	108·62	39·76	20·70	Nasirabad, 12 months; Dett. Neemuch, 11½ months; Taragarh, 7 months; Poona, 12 months.	9 10
1st Shropshire Light Infantry	932	1,305	15	42	91·64	1400·2	16·09	45·06	98·33	35·99	25·70	Calcutta, 12 months; Dett. Dum Dum, 11 months.	2 0
2nd Middlesex Regiment	1,019	1,244	11	14	80·84	1220·8	10·79	13·74	79·33	29·04	23·78	Ahmednagar, 12 months; Dett. Satara, 12 months; Kirkee, 10 months.	16 3½
1st King's Royal Rifle Corps	873	882	7	23	62·10	1010·3	8·02	26·35	71·13	26·04	25·77	Jullundur, 11 months (left for Mauritius on 30th November 1896); Dett. Dalhousie, 11 months.	5 11
1st Wiltshire Regiment	999	2,216	12	23	103·30	2218·2	12·01	23·02	103·40	37·85	17·06	Karachi, 12 months; Dett. Hydcrabad, 9¾ months.	1 3
2nd Manchester Regiment	930	1,221	6	20	84·05	1312·9	6·45	21·51	90·38	33·08	25·19	Dinapore, 12 months; Dett. Darjeeling, 12 months.	14 2
2nd Durham Light Infantry	955	1,228	19	38	81·02	1285·9	19·90	39·79	84·84	31·05	24·15	Mhow, ¾ months; Poona, 11¼ months	10 0
2nd Highland Light Infantry	984	1,281	12	32	93·18	1301·8	12·20	32·52	94·70	34·66	26·62	Cawnpore, 12 months; Dett. Chakrata, 6 months; Fatehgarh, 12 months.	12 2

2nd Seaforth Highlanders -	976	1,604	13	20	102·31	1643·4	13·32	20·49	104·83	38·37	23·35	Ferozepore, 12 months; Dett. Dalhousie, 12 months.	17 9
1st Gordon Highlanders -	974	1,070	11	22	71·38	1098·6	11·29	22·59	73·29	26·82	24·42	Rawal Pindi, 6¾ months; Gharial, 5¼ months -	4 11½
2nd Royal Irish Rifles - -	963	1,304	18	26	68·72	1354·1	18·69	27·00	71·36	26·12	19·29	Bombay, 2½ months; Poona, 9½ months; Dett. Deesa, 2 months; Ahmedabad, 2 months.	2 1
1st Royal Irish Fusiliers -	883	1,406	9	23	90·31	1592·3	10·19	26·05	102·28	37·43	23·51	Shwebo, 11½ months; marching by rail, ½ month; Dett. Bhamo, 11½ months; Poonamallee, 12 months.	13 2
2nd Argyll and Sutherland Highlanders.	939	1,462	10	25	88·95	1557·0	10·65	26·62	94·73	34·07	22·27	Nowshera, 12 months; Dett. Cherat, 5½ months; Fort Attock, 12 months.	5 0
2nd Royal Munster Fusiliers -	1,015	1.167	16	20	66·55	1149·8	15·76	19·70	65·57	24·00	20·87	Dum Dum, 12 months; Dett. Barrackpore, 12 months.	12 9
2nd Royal Dublin Fusiliers -	933	1,622	13	24	85·81	1738·5	13·93	25·72	91·97	33·66	19·36	Quetta, 2¼ months; Bombay, 9½ months; marching by rail, ¼ month; Dett. Deesa, 10 months; Deolali, 9¾ months; Ahmedabad, 10 months.	10 10
3rd Rifle Brigade - -	967	1,044	6	20	72·57	1079·6	6·20	20·68	75·05	27·47	25·44	Rawal Pindi, 5½ months; Kuldana, 6½ months -	7 10
Total - -	49,191	70,706	760	1,426	4761·45	1437·4	15·45	28·99	96·80	35·43	24·65		
Garrison Staff and Departments.	3,523	3,973	13	34	351·12	1127·7	3·69	9·65	99·66	36·48	32·35	Various.	
Men of various Corps, marching.	113	40	9	—	1·23	354·0	79·65	—	10·88	3·98	11·25	Various.	
Grand Total - -	70,484	97,738	1,046	1,966	6614·74	1388·7	14·84	27·89	93·85	34·35	24·77		

APPENDICES.

APPENDIX No. I.

REPORT ON THE PROGRESS OF HYGIENE FOR THE YEAR 1897.

By Surgeon-Colonel J. **Lane Notter**, M.A., M.D., Professor of Military Hygiene at the Army Medical School, Netley.

The chief points of hygiene which have attracted attention during the year under review may be briefly summarised as follows:—

I.—*Legislation.*

The session of Parliament which was brought to a close in August last gave us some legislative enactments of special sanitary importance.

The most important measure passed was the Public Health (Scotland) Act.

This Act has consolidated and amended previous Acts, and has also given a wider interpretation to many of the definitions used in previous Acts. For example, in section 16, sub-section 5, a "nuisance" is held to include mineral refuse; this is intended to meet the case of refuse heaps in connexion with mines, such refuse heaps being often in a state of combustion for months or even years. "Spent hops from breweries" are included, also manure or other refuse deposited within 50 yards of any public road wherever situated.

Section 60, dealing with infectious diseases occurring at dairies, is of especial interest and importance. In one respect this section makes a new departure in dairy legislation. Outside local authorities are to have no direct power of entry into the district of another local authority containing a suspected dairy, but are to have power to set in motion the local authority of the district in which the dairy is situated. Other sections give power for the creation of port sanitary authorities and for rural local authorities to make byelaws for new buildings.

Under the "Cleansing of Persons Act" power is given to any local authority to permit any person who shall apply to the authority, on the ground that he is infested with vermin, to have the use, free of charge, of any apparatus which the authority possess for cleansing the person and clothing from vermin; and local authorities may expend any reasonable sum on buildings, appliances, and attendants that may be required for the carrying out of this Act.

The "District Councils Water Supply Facilities Act" is an Act for giving facilities for a supply of pure water in rural districts. If a landlord contributes towards the expenses incurred by a rural district council in the provision of a pure water supply, the Board of Agriculture may make the amount contributed a charge on the land in the same way as other charges are made under the Land Act, 1864.

The "Dangerous Performances Act" extends the provisions of previous Acts to all male young children under 16 and females under 18 years of age, in lieu of 14. Except in the case of accident to a child or young person, prosecutions are not to be instituted without the written consent of the chief police officer of the district.

II.—*Literature.*

Many new books and papers have been added to the literature on sanitary science and public health work during the year under review. The following is a brief summary of the most important that have come under my notice:—

Twenty-fourth Annual Report of the Local Government Board. Supplement 1894–95.

This valuable report contains very instructive investigations made by the medical officers of the Board. The following reports appear to be the most important and instructive:—

In the autumn of 1894 a serious epidemic of enteric fever set in at Newport, in the Isle of Wight. Dr. Thompson, early in his investigation into the causes of the outbreak, found that general sanitary circumstances and milk supply could be eliminated from the list of possible causes, but it was otherwise when the water supply came under consideration. Out of 436 attacks, 432 occurred among the consumers of the public service.

The wells and springs in Carisbrook from which the Corporation of Newport derive their water supply are close to a considerable aggregation of houses. The wells are shallow ones as chalk wells go. The Carisbrook houses mostly stand on chalk, and the drainage of many of them is into cesspools which are so constructed as to allow soakage of their contents into the surrounding soil. The natural trend of the underground water is such that it would encounter on its way to the waterworks some of these leaking cesspools, and the effect of pumping would tend to draw water and cesspool soakage from a still wider area. The physical circumstances of this public water supply were enough, without the convincing proof given by bacteriological examinations of the water and the lithia test, to show the ever-recurring certainty of its pollution by the excreta of man and animals.

Dr. Bruce Low investigated an anomalous febrile illness at Hatfield, in Suffolk. The incidence of the malady was almost solely on infants and on children under 10 years of age, and the leading features of the disease were vomiting, drowsiness, fever, diarrhœa, herpes of the lips, sore throat, bronchitis, or pneumonia.

Dr. Low suspected that the disease was allied to cerebro-spinal-meningitis.

Another report deals with an occurrence of small-pox in and around Hastings. Its main interest may be regarded as having to do with the diffusion of small-pox to the people living in the neighbourhood of a small-pox hospital apart from any communication with infected persons or things.

Some of those attacked by small-pox were inmates of the workhouse, a separate institution, situated at a distance of 250 yards from the small-pox hospital. According to Dr. Low no explanation could be found of the development of the first cases in the workhouse, except on the theory of "aerial convection" of the small-pox poison.

In connection with the so-called "return cases" of scarlatina, Dr. T. W. Thompson investigated the circumstances under which scarlatina had manifested itself anew in certain households to which patients from the Bromley and Beckenham District Council Hospital had been returned on recovery from scarlatina. After consideration of all the facts Mr. Thompson considered that, whilst a distinct proportion of re-invasion was due to the return of hospital patients, it was not improbable that other agencies were in operation, such as excess in that class of household of persons at the ages most susceptible to scarlatina; the influence of season and stage of the epidemic had an important influence, for with a decadence of the epidemic the number of return cases sensibly declined.

Dr. Theodore Thompson furnished a special report on the control of measles, and in setting out those preventive measures which are to be thought of as practicable, he has kept in view the special difficulties which attach to the dealing with this disease by way of prevention. Prominent among these difficulties are the extremely infective character of measles before the nature of the disease is declared, and the slight estimation in which measles is held by the general public. The preventive measures advocated are:—(1) Compulsory notification accompanied by prompt and systematic visitation; (2) isolation and disinfection; (3) complete information to be afforded by the sanitary authorities, and all children from an infected house to be rigidly excluded from school; (4)

in the case of any exceptional prevalence, general closure of public elementary, Sunday, and private schools. Each one of these measures indicated must be regarded as necessary and supplementary to the others.

There was not a single death from Asiatic cholera in 1894. The view has commonly been held that where cholera has succeeded in making its way into this country in any one year there was every prospect of its recrudescence in epidemic proportions in the succeeding year.

Date.		Cholera Deaths.
1st period	1848	1,105
	1849	53,293
2nd period	1853	4,419
	1854	20,047
3rd period	1893	135
	1894	—

A glance at these figures shows an exceptional experience in 1894, which has been brought about in sequence to the adoption over a long series of years of local sanitary measures, such as have never before had so powerful an influence in the removal of causes of preventable disease and death.

Dr. Barry in his cholera report submits the following definite conclusions:—

(1.) The diffusion of cholera from one place to another has invariably followed the lines of human intercourse.

(2.) Increased facilities for steam communication by land and by water have conduced to a rapidity in the diffusion of cholera hitherto unprecedented.

(3.) Cholera in its progress by way of river traffic has fastened over more centres of population than when its diffusion has taken place over land.

(4.) All "explosions" of cholera have been found on investigation to have been referable to specifically polluted water supplies.

In further study of the etiology of enteric fever, and in view of the ability of the typhoid bacillus to multiply in the lymph glands of the calf, Dr. Klein has sought to ascertain whether its life processes within the body of this animal lend themselves to the production of antitoxic serum that will protect against enteric fever.

Dr. Klein subjected the calf to repeated subcutaneous injection, in gradually increasing doses, of living cultures of the typhoid bacillus.

From a calf thus dealt with, blood was withdrawn at several stages of the preparatory process, and serum separated from the blood was injected into guinea pigs just before or at the same time that they were also injected with an ordinary fatal dose of living culture of the typhoid bacillus.

The blood serum was administered sometimes subcutaneously, sometimes into the peritoneum; the poisonous dose of typhoid bacilli was injected each time into the peritoneum.

Serum taken after the fifth and seventh injections of the calf was found capable of protecting a guinea pig, since ·25 c.c. injected per peritoneum was sufficient to prevent the animal having anything but a very slight indisposition after the injection per peritoneum of an otherwise fatal dose of living typhoid bacilli administered half an hour later. It is impossible to draw definite conclusions from these experiments, seeing that their number was not sufficiently large, but so far as they have gone they encourage hope of a prophylaxis as regards enteric fever.

In 1893–94 Dr. Andrews and Mr. Percy Lawes showed that the typhoid bacillus kept in ordinary fluid sewage has no tendency to multiply, but diminishes in numbers and ultimately dies. On the other hand they found that the bacillus coli under the same conditions retains for a long time itst vitality and power of self-multiplication. Dr. Klein, from recent experiments, has shown that the typhoid bacillus readily multiplies in sewage containing nitrates; in pure sewage it does not multiply but decreases in number. The same results were obtained with the cholera vibrio. The bacillus coli in pure sewage maintains its power of multiplication for a long time; in Dr. Klein's experiments after three weeks it yielded on culture innumerable colonies.

As regards drinking water, Dr. Klein has shown that the typhoid bacillus and cholera vibrio may persist longer than has hitherto been demonstrated. In tap water after inoculation the bacillus typhosus could be found after a lapse of 36 days, and the cholera vibrio survived for six weeks. The variability of laboratory experiments can be explained by the presence or otherwise of nutritive material in the water examined. In all cholera and typhoid contaminations of waters under natural conditions there is not merely pollution with the microbes, but pollution also with organic and nutritive material contained in the stools themselves. This was the case in the Caterham and Worthing typhoid fever epidemics. Therefore, in experiments on natural waters it is important that small quantities of nutritive material should be added, and when this is done the vitality of the typhoid bacillus and of the cholera vibrio is materially enhanced. The bacillus coli was found very little hardier than the typhoid bacillus in both sterile and non-sterile tap water.

In continuance of his studies of protective inoculations Dr. Klein is of opinion that no method of prophylaxis based on inoculation of Koch's vibrio is likely to prove of service, unless the vibrio be injected in the living state and under conditions enabling it to elaborate from the tissues of the person in whom it is implanted those specific toxins upon which it specificity depends.

In his studies on diphtheria Dr. Klein has found that the therapeutic value of a blood serum, prepared by injections of the toxin produced by the bacillus diphtheria, is in no sense testimony to its prophylactic utility. By injections with living cultures of the diphtheria bacillus blood serum having the required property seemed likely to be produced. Dr. Cautley has examined bacteriologically numerous articles of food heretofore convicted of producing gastro-enteric illness in man, but so far he has not found any bacteria of recognised pathogenicity for the human subject. Dr. Kanthack, from his observations on the pneumococcus of Fraenkel, is indisposed to accept this organism as the essential cause of any of the diseases with which it is associated.

Dr. Sidney Martin has found that the toxic substances produced in the bodies of patients who have died of acute traumatic tetanus consist of albumoses and certain substances not proteid in nature, some of which are soluble and others insoluble in ether. The albumoses produced fever, but showed no other specific action. The substances soluble in ether produced spasms and death when injected intravenously. By further research Dr. Martin showed that the tetanus albumoses produced slight fatty degeneration of the heart and nerve degeneration, and antitoxin did not appear to have any influence in counteracting these results.

The toxin, in the poisonous substance produced by the bacillus when grown in a culture fluid not containing a digestible proteid, appears to be in all probability a proteolytic ferment, and the albumoses are the products of its activity.

The Laboratory Text Book of Public Health. By W. R. Smith, M.D. London. 1896.

This work is a manual compiled, from the best sources, of various exercises in physics, meteorology, air, food, water analysis, and bacteriology. Only, comparatively speaking, a sketch of such various subjects is given. Water analysis is detailed in about 60 pages, but the interpretation of results obtained is almost wanting.

The section on bacteriology is brought up to the latest date, and valuable information in a concise form is given.

A Practical Guide to Meat Inspection. By J. Whalley. 3rd edition. London. 1896.

The third edition of this excellent work has been prepared by Professor McFadyean. The book is a concise but trustworthy guide to a difficult subject, and its value is much enhanced by a large number of coloured illustrations. There is a very thorough account of tubercle as it affects bovine and other animals used as food, with a full appreciation of the bacteriological and experimental side of the question.

Applied Bacteriology. By T. H. Permain and C. G. Moor, M.A. London. 1897.

This volume gives a terse and comprehensive account of the science of bacteriology. The chapter on immunity is somewhat superficial in its treatment. The book seems suitable for candidates preparing for public health or State medicine examinations.

A Simple Method of Water Analysis. By J. C. Thresh, M.D. London. 1897.

This work is intended for medical officers of health. The method dispenses with the use of distilling apparatus and volumetric solutions, the place of the latter being taken by soloids of definite strength. The chapter on the interpretation of results is of special value.

Milk and Milk Products, being Part I. of a *Manual on the Analyses of Food and Drugs.* By T. H. Permain and C. G. Moor. London. 1897.

This work is founded on *Aides to the Analyses of Food and Drugs,* by the same authors. The question of standards for food products has excited much discussion, and the authors' proposed standards are worthy of consideration.

Hygiene for Beginners. By E. S. Reynolds. London. 1896.

This is a short but excellent little book. It is an expansion of a *Primer of Hygiene* written by the author in 1894. It contains an excellent chapter on barracks. The chapters on ventilation, warming, lighting, and the dwelling house are clearly written.

Archives af Maritime and Tropical Hygiene. Edited by Dr. C. Mense. Vol. I., Part I. Cassell. 1897.

This journal has been established to disseminate information concerning subjects of importance to those concerned in maritime travel and colonial enterprise. The number contains a study of malarial fevers in the tropics by Dr. A. Plehn. Dr. Nocht, of Hamburg, contributes an article upon Sanitary Police Measures for preventing the importation of infectious disease by sea, in the course of which he describes the quarantine and other regulations adopted by various countries. A description of coolie hospitals in Sumatra and a paper on Beri Beri complete the original articles.

Water and its Purification. By Samuel Rideal, D.Sc., &c. London. 1897.

Despite its conveniently small size, the book covers the whole ground of recent developments, even as far as the now admitted worthlessness of the majority of domestic filters and the value of Dibdin's method of examining with minute exactness the insoluble matter in water, the recent application of which led a few months ago to an unfavourable opinion on the quality of the London supply. The last chapter on the analysis and interpretation of results is especially good, summing up the value of both bacteriological and chemical analysis without prejudice for or against the respective merits of these two methods.

III.—*Work of Societies.*

At the Twelfth International Congress of Medicine, which has just concluded its session in Moscow, many interesting subjects were discussed in the section devoted to hygiene. A brief *résumé* of a few of the papers may not be uninteresting. Professor V. C. Vaughan, in a paper "On the Prevention of Tuberculosis," recommends that the following means should be adopted :—

1. That no milkman should sell milk without a license from the municipality. This permission should not be given until the cattle have been inspected by a competent veterinary surgeon. The tuberculin test should be applied to every animal, and any found suffering from tuberculosis should be destroyed.

2. All animals kept for milking purposes should be submitted to an examination by a competent veterinary surgeon.

3. Disinfection of sputum of persons suffering from pulmonary consumption is indispensable, and these persons should not be allowed to expectorate in streets or public vehicles.

4. All houses which have been inhabited by phthisical persons ought to be disinfected.

5. The Government ought to construct, organise, and maintain hospitals for paupers suffering from tuberculosis.

These hospitals should be of two classes—one for incurables and the other for persons who may recover.

6. Tuberculosis is a disease which, taken in time, is, comparatively speaking, easy to cure; therefore persons who are yet in the early stages of the disease ought to be auscultated at least once or twice a year by a doctor. Government ought to provide for the poor the means of having this done.

On the question of the prophylaxis of bovine tuberculosis, Professor Nocard arrived at the following conclusions:—

1. Whenever a tuberculous animal has been included in a herd, whether the disease has been detected before or after death, all the other animals should be submitted to the tuberculin test.

2. Animals found to be healthy should be at once separated from those diseased and housed in byres which have been thoroughly disinfected. No animal should be added to a tested herd except after undergoing the tuberculin test.

3. Of the beasts reacting to the tuberculin test a minute examination should be made, after which they may be divided into two groups:—

(*a.*) Those presenting no external manifestations of the disease, such as expectoration, enlargement of the glands, &c.; these will constitute the larger class, even in the most infected byres. It is not necessary to slaughter such immediately; usually such beasts suffer from recent infections only, the morbid processes are very limited and occasionally quite insignificant, and the animals can hardly be regarded as centres of infection. Their owner may safely continue to use them for work or for milk supply, or they may be disposed of to the butcher at the best price, and at as early a date as possible.

(*b.*) Those with external manifestations of the disease, such ought to be slaughtered at once. They are suffering from the disease in an advanced stage, and are a grave source of danger of infection to the other members of the herd; the milk of cows in such a state should not be used. The disease is either generalised and the milk exceedingly dangerous, or the disease so far advanced that there is a danger of its becoming generalised any day, and the milk becoming a medium for the dissemination of the bacillus.

4. Beasts which have been proved to be tuberculous should not be sold except for slaughter. Should the flesh be condemned and seized the owner should be awarded compensation for the value of the meat seized.

Professor Victor C. Vaughan read a paper on the Bacteriological Examination of Drinking Water.

The examination has consisted of the ordinary plate tests, counting the number of germs per cubic centimeter. In addition to this animals have been inoculated with mixed and pure cultures of the germs obtained from each of the waters examined. The pathogenic germs which have been found in water may be divided into two classes, viz., those of the colon group and those resembling the typhoid bacillus. Water containing germs belonging to the colon group have not been condemned, while those containing germs resembling the typhoid bacillus have been. The fact that in every instance the epidemic of typhoid fever has ceased on the discontinuance of the condemned water indicates that such analyses are of value.

The Congress of the Sanitary Institute was held this year at Leeds, under the presidency of Dr. Farquabarson, M.P. Many papers of interest were read, and the discussion that followed was most interesting and practical.

Dr. H. Kenwood gave a most excellent paper on the "Disinfection of Rooms by Formic-Aldehyde Vapours," and Dr. Sims Woodhead, Dr. Rideal, and others made critical contributions to the discussion. The following extract from Dr. Kenwood's paper is worth quoting:—"There "can be no gainsaying that the infection of the infectious diseases which we "have commonly to deal with is very easily destroyed under the ordinary "circumstances of its existence apart from the human body, and that this

" matter of disinfection has been made to appear a much more difficult task " than it actually is from the circumstance that, in experiments, disinfectants " are asked to accomplish a great deal more than they would now have to do " in actual practice. In ordinary practice we probably have to deal with " non-spore-bearing bacteria of comparatively easy destructibility, and these " bacteria do not find at their site of lodgment anything approaching the " fostering and protective properties of the nutrient media in which they " are planted in experiments." The following are the conclusions which Dr. Kenwood states may be accepted as amply warranted :—

(1.) That when the atmosphere is saturated with or charged with from ½ to 2 per cent. of the vapour, the disinfection of all surfaces is complete and rapid, and that this holds good under the ordinary conditions of temperature and moisture obtaining in living rooms.

(2.) That the vapours possess a certain and variable amount of penetrating power, especially when these are dry. This penetration is largely due to the circumstance that when produced in a warm state the vapour is of a low specific gravity and mixes well with the air.

(3.) That the vapours do not affect the colours of textile materials, &c. or (with the exception of iron or steel) metallic surfaces.

(4.) That the room, and articles exposed, can be cleared of the vapours readily by sufficient aëration, and the vapours are not so irritating but one can always enter the room and unseal at the first attempt (an advantage over SO_2 and Cl).

(5.) That the disinfecting properties of the aldehyde are greater than those of SO_2 or Cl.

(6.) That there is no danger in entering the room, either from the aldehyde or from the CO. which is formed at the same time. This is proved from the fact that the men employed in the works and exposed to considerable quantities enjoy good health, and also from many experiments with animals in atmospheres heavily charged with vapours generated as in room disinfection.

A 40 per cent. solution of formic-aldehyde in water is known as " formalin," but when this solution is heated the aldehyde becomes largely polymerised into a whitish amorphous substance known as " paraform," which gives off slowly a little aldehyde. Dr. Kenwood states Trillat's apparatus is preferable to any other, since an ordinary-sized room can receive its maximum dose in half an hour, whereas with lamps the same end is not reached under an hour. The apparatus costs about 20*l.*, and the disinfection of an ordinary-sized room would cost about 2*s.* 6*d.* Half an hour is required to get up the necessary pressure, and then the vapours must be allowed to escape into an ordinary-sized room for half an hour, and for an hour in a very large room.

The method of using this apparatus is as follows:—The 40 per cent. solution of formic-aldehyde is heated under pressure in an autoclave provided with a pressure gauge and a thermometer. A little chloride of calcium is placed in the solution, and as the boiling point of the calcium chloride solution is well above 100° C, and the gas comes away below 100° C., practically the whole of the aldehyde (fairly pure and dry) is given off before the water comes away as steam. The apparatus needs attention, and so it is placed outside the room. The solution is heated in the autoclave by means of a Swedish petroleum lamp, and when the pressure registers 40 lbs., the vapours are allowed to escape through a long thin copper tube, which is placed through the keyhole into the compartment.

The bacteriological tests made by Dr. Kenwood showed that aldehyde vapour was sufficient in destroying the Klebs-Löffler bacillus.

The construction of isolation hospitals was the subject of an exhaustive paper by Mr. E. J. Hall F.R.I.B.A. Mr. Hall dealt chiefly with a detailed description of the new Park Hospital of the Metropolitan Asylums Board, of which Mr. Hall is the architect.

The Park Hospital is the largest hospital for acute cases of fever and diphtheria in the United Kingdom, providing, as it does, for 548 patients. It contains 42 buildings, has 6 miles of drains within the curtilage, 29 miles of water and steam pipes, 42 miles of electric wires, and 3 miles of eaves guttering.

Mr. Hall recommends teak floors for the wards, in long narrow boards laid in bitumen and edge-nailed directly to the concrete. This floor, wax polished, is hard, warm, and impervious. Objection is taken to terrazo flooring for wards, because of its multitudinous joints, and it is hard and unsympathetic to the feet.

For scarlet fever patients the Asylums Board have fixed 20 patients for each ward. The height of each ward should be 13 feet, 2,000 cubic feet being allowed for each patient and 12 feet of linear wall space per bed. For diphtheria 2,500 cubic feet are required per bed, and a wall length of 15 feet. The ward in each case should be 26 feet wide.

The system of heating adopted is by low pressure hot water radiation beneath windows, the coils being enclosed in iron cases with hit-and-miss covers. Mr. Hall has adopted a central stack as preferable to a stove with horizontal flues carried to the external walls. The whole of Mr. Hall's paper is worth careful study by all who have to advise as to practical details in the construction of a fever hospital.

Dr. J. Brown, Medical Officer of Health for Bacup, read an instructive paper on "Poisoning from Canned Foods."

Over 580,000 lbs. of canned foods, it was estimated, were consumed daily in this country. Dr. Brown gave particulars of a number of cases of poisoning (including six deaths) from eating canned meats—beef, mutton, rabbits, and tongues—and six from canned fish. In canned meats the poison was probably due to one of the ptomaines, which were of bacterial origin, and might have been produced (1) before the meat was canned, (2) after canning, or (3) after being opened. In the first case the toxic properties were probably rendered inert by the steaming process, but the nutritive value of the meat was lessened. In the second case the can was usually in the condition technically known as "blown," the gases produced by putrefaction causing so great an internal pressure that the ends were convex instead of concave. There was little danger of anyone consuming these, as the putrid condition and bad smells were manifest. After being opened under certain conditions of the atmosphere foods were rapidly acted upon by bacteria, which formed toxins, some of which were more dangerous than the mineral poisons. This was particularly so in fish, salmon being the worst. In canned fish ptomaines were the chief poison, salmon being the kind of fish which in nearly all cases had been associated with poisoning.

In canned fruits the salts of tin and zinc had been the poisons; the symptoms had been those usually associated with metallic poisons. From the analyses made, it was found that cans in which lead was used in tinning or soldering, lead was present in the fruit and syrup due, first, to the action of natural acids, and, secondly, to galvanic action. In meats the metal was chiefly found where it was in contact with the soldering and plating: in fruits it was present in the syrup, and also throughout the substance of the fruit. All canned goods should be kept in a cool and dry place. Shop windows should not be filled to such an extent that the cans become heated. This was especially harmful in regard to tinned fruits, as alcoholic fermentation was set up. Fruits should be whole and unskinned, so that any metallic salt in the syrup would not saturate the fruit. Semi-lead or "terne" plating ought not to be permitted. Consumers should avoid cheap brands of canned foods. When opened the contents should at once be poured into a jar or other vessel. In regard to canned fruits, pears and apricots had shown the largest amount of dissolved lead and tin, probably due to the large amount of acid in the juice of these fruits. Pine-apples were the safest fruit to buy in cans. Fish in a yellowish soft and friable condition, especially salmon, ought to be avoided. If the plating of the can is corroded the contents of the tin should be thrown away. If it had a bluish slate colour and contained fruit it was also risky. The Government should forbid the importation of canned foods in which the tin used for tin plating contained more than one per cent. of lead or more than ten per cent. of solder. This law had been in force in Germany since 1889. The Government should also enact that the date of canning should be legibly stamped on each can.

Dr. Tattersall read a paper on "The Action of Moorland Water on Lead "and the Prevention of the same." After discussing the origin of the plumbo-solvent properties of moorland water, he suggests that the best means of preventing lead-poisoning by moorland water are:—

"(1.) That the water be got off the peaty gathering grounds as quickly as possible.

(2.) That as much time as possible be given for subsidence and bleaching.

(3.) And, most important, that the water be filtered through ordinary sand filters, or, failing this, be passed over "Paris white," as at Sheffield.

(4) That block tin-lined lead piping of good quality be used for water service pipes instead of ordinary lead piping.

The sanitary aspects of wood paving was the subject of a paper given by Mr. C. Mason. Ashphalte is the best pavement, but its general adoption must be postponed until horses are replaced by motor cars and cabs. Next to this comes wood, the hard woods from the Antipodes being preferable to the pines of North Europe so commonly employed. The life of a wood pavement varies from 5 to 12 years according to the amount of traffic, quality of wood, and method of laying. Apart from a faulty system of scavenging, which can easily be remedied, Mr. Mason laid stress on the fact that the complaints as to the sanitary condition of wood pavements were due to imperfect methods of laying and maintaining, coupled with insufficiently frequent renewals. Wood pavements are condemned on sanitary grounds because:—

(1.) Too little attention has been given in the past to the contour of the road to allow for a natural fall to the gullies.

(2.) The wood used has in many cases not been carefully selected and properly treated with a preservative.

(3.) The expansion joint in each channel is allowed to become a source of nuisance,

(4.) Repairs have not been carefully executed, and renewals have not been made at frequent intervals.

(5.) An inefficient system of scavenging has been allowed to exist.

The hard woods known as "Jarrah" and "Karri" are generally laid close jointed and grouted with pitch and tar, and form an excellent sanitary pavement; their liability to contraction, however, has proved a drawback, as the spaces left between the blocks, when contraction takes place, becomes filled with horsedung and road detritus, which it is impossible to get out. Mr. Mason stated that wood is suited for town pavements, being less noisy and less slippery than any other kind of pavement which is suitable for heavy traffic. Soft wood should be properly creasoted, the blocks laid "close jointed" to a contour transversely and longitudinally, and grouted with bituminous composition. Wood blocks thus laid and cleansed by periodical washing form as perfect a pavement for carriageways as it is possible to obtain.

Dr. V. Poore read a paper on the treatment of domestic slop-water. In discussing the subject he points out that:—

(1.) Slop-water is as foul as sewage, composed of excrement and slops.

(2.) A system of sewage is necessary for the slop-water, and it is not easier to treat slop-water alone than it is to treat a mixture of slops and excrement.

The fact that the total solid and suspended matters are less by 3½ grains in the watercloset towns than in the midden towns can only be accounted for by the enormous dilutions of the excremental matters in the sewage. Notwithstanding this dilution we find that the watercloset town sewage contains 20 per cent. more combined nitrogen than midden town sewage, 23 per cent. more ammonia, and, what is very remarkable, 35 per cent. more suspended mineral matter.

This excess of mineral matter in suspension could only be caused by the precipitation of mineral matters by the ammonia and sulphuretted hydrogen formed by decomposition of the albuminous and other organic matter. This excess of mineral matter in suspension must, therefore, be taken as a measure of the enormously increased putrefaction in watercloset sewage, a putrefaction probably to a great extent brought about by the millions of microbes which are provided from the human intestines with the excrement, and we must therefore assume that the increase of mineral matter in suspension is an indication that a large quantity of foul putrefactive gases has been given off into the streets and houses of watercloset towns.

Dr. Poore lays stress on the following important points:—

(1.) All waste pipes should terminate well above the level of the ground.

(2.) No stagnation must anywhere be permitted along the line of slop drainage.

(3.) Slop-water should run into open gutters, and when it has reached a certain distance from the house it should be allowed to soak away as it runs, and take the line of natural drainage of the locality. This is effected by means of filtration gutters.

(4.) When it is feasible, it is advisable to allow different varieties of slops to flow in separate gutters.

By far the most interesting series of papers and discussion was "On the Treatment of Sewage." Mr. Dibden gave an excellent paper on "The Scientific Basis of Sewage Treatment." He states that:—

In the recognition of the fact that all processes of sewage purification must be made subservient to the requirements of the various micro-organisms lies the whole secret of success.

All sterilising or antiseptic agents must be strictly excluded; a condition of neutrality or slight alkalinity must be maintained; oxygen, anyhow in the final stages, must be freely supplied; the temperature must be kept above the freezing point of water, and the amount of food must be proportioned to the powers of the organisms.

In the process of completely oxidizing effete matters two stages may be recognised in which distinct classes of organisms play their respective parts. The actual identification of these organisms may be left for future discussion, it being sufficient for the present purpose to divide them into those that are able to break down and liquefy solid organic matter, and those that deal with it when in solution. It is not pretended that a clear line of demarcation can be established, although between the extremes of either class there are very distinct and clearly defined functional differences. The first-mentioned class may again be divided into two—viz., those that do their work in the presence of air, and those that thrive in its absence. Both of these are always present in ordinary sewage, and the predominance of one or the other is entirely in the hands of the sewage operator. If, as at Sutton, the first be employed, care is taken that oxygen shall have free access to every part of the culture medium; the beds are frequently entirely emptied to admit the air to every crevice; and the most successful work hitherto has been by working and resting intermittently.

When, however, the anærobians are employed air is rigidly excluded; a fermentative action of a putrefactive character is encouraged and the process is necessarily continuous. This is the method which has been adopted with such satisfactory results at Exeter. Into the relative merits of these two systems, ærobian and anærobian, the author does not propose to inquire; both are based upon scientific principles, both have been highly satisfactory in practice, and both remove once and for all the troubles of sludge disposal.

The following summary is particularly valuable; it sets forth plainly the conditions an effluent ought to fulfil:—

(1.) It must contain practically no solids in suspension.

(2.) It must not contain in solution a quantity of organic matter sufficient to seriously rob the stream into which it is discharged of its oxygen.

(3.) The organic matter it contains must be in such a condition as to yield readily to the natural purifying influences exerted upon it.

(4.) It must not be liable to putrefaction or secondary decomposition.

(5.) It must contain nothing inimical to microbean growth and activity; in other words it must not be sterilised or treated with antiseptics.

(6.) It must not contain pathogenic organisms.

Mr. Donald Cameron, the city surveyor, of Exeter, read a paper on "A Year's Experience of the Septic Tank System of Sewage Disposal at Exeter." He states that the Exeter installation during its twelvemonths' work has been subjected to the severest conditions that sewage works have to contend with, and has proved thoroughly reliable in all respects. The trial has been on a sufficiently large scale to give practical results, and is the outcome of experiment, step by step, leading from smaller to larger plants. It has been shown that sewage-disposal works can be designed so as practically to take care of themselves, requiring no more attention than a visit two or three days a week to change or alternate the filters, the work of a few minutes, and a day's work every month or six weeks in tidying the filters. Once a year it may be desirable to remove the deposit from the tank; by proper arrangements this can be done by the one man who acts as caretaker.

The initial cost is very moderate, being often less than is spent in laying out a sewage farm to serve an equal population.

I may here remark that the object of the various systems of sewage treatment at present employed is by the addition of chemical agents to precipitate the organic matters in suspension and solution, and to obtain an effluent as nearly sterile as possible. Grether has clearly demonstrated the fact that the addition of large quantities of lime—and lime forms the bases of nearly all precipitation processes—exceeding the amounts that can be practically employed, fails to disinfect sewage, and that when highly diluted with river waters there is no proportionate reduction in the number of organisms. Increasing attention is now given to the treatment of sewage by biological methods. No attempt at sterilisation is made, but all processes are subordinated to the requirements of organisms which by their growth effect the desired change in the sewage. Two such processes are those now referred to.

The septic tank system has been experimentally tested at Yeovil and Exeter. The sewage, after mechanical subsidence of the larger suspended matters, passes into a covered tank from which air and light are as far as possible excluded; it is here acted upon by anærobic organisms. The suspended organic substances are dissolved, and there is little sedimentation or formation of gas. The process is completed by passing the effluent over aërating troughs and through coke-breeze filters, where the ærobic organisms complete the process, the result is a clear effluent containing only a comparatively speaking small amount of dissolved organic impurities, and no suspended matters.

Mr. Dibden has erected some experimental works at Sutton for the London County Council. Beds of burnt ballast 4 feet in thickness are here employed. To these beds is added a culture of the *Micrococcus caudicans*, an organism isolated by Dibden from coke-breeze filters.

Sewage pumped on the beds is allowed to remain for two hours; the organic matter present is oxidised by the micro-organisms, and after filtration through land the effluent is in a fit condition to be turned into watercourses. The life of the purifying beds is practically unlimited. Each is used twice daily, and it is calculated that one acre of filter can purify 1,000,000 gallons of sewage daily, requiring only a brief time for recovery. The capacity of the filter may be increased either by increasing the surface or the depth, for the action is not confined to the surface layers.

Both these methods aim at destroying organic matters in Nature's own way, namely, by the work of bacteria. Should they prove satisfactory, a great economy would be effected, for the use of chemicals, settling tanks, and much pumping machinery could be dispensed with.

The annual meeting of the British Medical Association was held this year in Canada, the address in public medicine being given by Dr. Herman Bigg. This address is an excellent *résumé* of the work done in the United States, especially in New York. In the United States there is no National Board of Health comparable to our Local Government Board. In each of the States of the Union the sanitary administration is solely under the control of the State authorities. In the rural districts and towns the sanitary methods are of the crudest type. On the other hand in many of the large cities there is found an enlightened policy and efficient administration. New York may be taken as a type of the large cities, and a short account of the sanitary methods in vogue will be found at once interesting and instructive.

The Health Department of New York City is organised under a special Act, and the Board of Health consists of four members, invested with ample powers, executive, judicial, and legislative in character. All matters connected with the scientific investigation, diagnosis, care or sanitary supervision of infectious diseases are regarded as coming within the province of the Board of Health. The duties of sanitary authorities relating to infectious diseases are limited to the inspection of reported cases, their removal to hospital when required, and subsequent proper disinfection of the premises. Under the control of the Board of Health there is a bacteriological laboratory for the diagnosis of cholera, diphtheria, tuberculosis, and the preparation of antitoxic serum. A special laboratory and stable are devoted to the preparation of bovine vaccine virus. Diagnosticians are on duty day and night so as to afford expert aid in the clinical diagnoses of contagious diseases. There are also veterinary inspectors responsible for the application of the tuberculin test for the diagnosis of tuberculosis in cattle, and the diagnosis of other infectious diseases of cattle and horses.

The methods of procedure in relation to diphtheria and tuberculosis have been developed to an unusual extent in New York. Every case of diphtheria is reported directly by the attending physician, or by forwarding a culture to the laboratory. If Loeffler's bacilli are found, cultures are made at frequent intervals until examination shows that the organisms are no longer present. The case is then referred for disinfection. Every case of diphtheria is recorded on a card index and plotted on a sectional map of New York City.

A special corps of inspectors is assigned to the administration of diphtheria antitoxin. It is the usual course to immunise all members of the family who have been exposed to infection. Experimental investigations are constantly carried out to determine the virulence of diphtheria bacilli found in healthy throats and follicular tonsillitis.

The attitude of the Health Department towards pulmonary tuberculosis, and the measures adopted, are a most important feature of its work. Tuberculosis is declared to be an infectious and communicable disease, dangerous to the public health, and notification of all cases in the city is required. Tuberculosis is distinctly separated from the eruptive diseases, it is not classed with them as a contagious disease. In the treatment of apartments vacated by tuberculous patients, renovation is ordered rather than disinfection attempted. Public institutions are compelled to report the admission, transfer, and discharge of tuberculous patients. Special general hospitals for the treatment of the poor suffering from tuberculosis are strongly advocated. The sale and transportation of milk is forbidden without special permits from the Health Department. All milch cows are being subjected to the tuberculin test, and animals found to be diseased are killed. It is intended to apply the same test to all cows whose milk is sent to New York City. Dust in street cars and various public places having been found infectious, an enactment has been passed forbidding spitting in public conveyances and places, and requiring all companies to post notices to the same effect. There is a careful inspection of animals slaughtered for food, and the carcasses of those found to be tuberculous are destroyed. The education of the public has also been attempted, and with encouraging results.

The system of medical school inspection, instituted by the Health Department in 1897, has given most satisfactory results, and promises greater good in the future. 150 medical school inspectors have been appointed by the Health Board after civil service examination, who are required to attend daily at the opening of the public parochial and industrial schools, and examine all children set apart by the teachers as not appearing entirely well. Every pupil found to be suffering from any form of general contagious disease, or any contagious disease of the eye, or any parasitic disease of the skin, is sent home with a written statement to the parents of the cause for the action, and in the case of the eruptive diseases and diphtheria reports are immediately forwarded to the district medical inspectors for inspection and supervision.

It has been the custom of the Health Department for some years past to issue from time to time circulars of information on various topics, and especially with relation to the infectious diseases, their diagnosis, treatment, or management. The importance of this educational work cannot be overestimated. The following paper, read at the Section of Public Medicine, is worthy of special note. The subject was, "How far mandatory Measures are "of value and practical in Measles and Whooping-cough," by P. H. Bryce, M.A., M.D.

In this paper Dr. Bryce urges the following measures of practical utility:—

(1.) Notification daily by the school authorities of every absentee.

(2.) Immediate inspection by a competent medical health officer of every absentee.

(3.) Notification by the teacher of any further cases of disease, and their immediate removal from school.

(4.) The compulsory notification by the householder of every case occurring in the house.

(5.) In view of the great cost of isolation hospitals for measles, isolation in the house, the public to be warned by placard.

(6.) Disinfection of houses, articles, books, &c.

(7.) The closure of schools as a last resource.

For whooping-cough :—

The same measures might be advocated. The first practical difficulty in dealing with this disease arises from its infectivity before the characteristic cough has developed. The school authorities should be informed of this fact, and required, when whooping-cough has developed in any municipality, to send any child from school who has developed a cough until the true nature of the disease has been ascertained. Isolation by placard of the children of a household for six weeks is inevitable if the spread of the disease is to be checked.

As regards tuberculosis :—

(1.) Compulsory notification by physicians and householders.

(2.) Regulate the residences of the tuberculosed.

(3.) Control as far as possible the movements of the tuberculosed.

(4.) Establish houses and hospitals for the infected poor.

As regards scarlet fever, Dr. Neech believes that the specific poison is stored up in the lymphatic glands. As the inflammation ceases and the enlargement becomes absorbed, the virus passes again into the blood stream, and is eliminated during convalescence by the different emunctory organs. Careful disinfection of the discharges from the bowels and kidneys is therefore recommended, together with a minimum isolation of eight and a maximum of thirteen weeks.

IV.—*Special Points of Hygiene.*

Bacteriological Examination of Water.—The examination of potable and other waters is again brought forward by Dr. Klein, who does not consider Frankland's process entirely satisfactory.

Dr. Klein recommends that large quantities of the water under examination be pumped through a Berkefeld or Pasteur filter, and the deposit on the candle diffused in 5 to 10 cc. of water, cultivated in phenol broth and phenol gelatine. From our experience at Netley we are inclined to believe that Dr. Klein's process is sound in practice, and by using carbol-gelatine plates, an opinion, if urgently required, might be furnished in 48 to 72 hours, whereas with Frankland's method a week must elapse before a reliable opinion can be given.

For the detection of the cholera vibrio, the conversion of several hundred cubic centimetres of the water into a one per cent. peptone solution, followed by incubation in sterilised flasks, is to be strongly recommended.

Sterilising Impure Drinking Water.—Staff-Surgeon Dr. Schlumburg recommends for the use of troops on active service, travellers in the tropics, &c., the addition of bromine, which after five minutes is neutralised by ammonia.

He uses a solution of 20 parts each of bromine and potassium bromide in 700 of water, and a 9 per cent. solution of ammonia for neutralisation. For complete sterilisation of Spree water 0·2 c.cms sufficed, but more is required for foul ditch or marsh waters, and for any hard waters in which the lime salts neutralise some of the bromine. Waters so treated are sterile, clear, and practically tasteless, while all bacteria, pathogenic and others, are stated to be effectually destroyed. We are making a series of experiments in accordance with these suggestions, which I hope to refer to in my next report.

Disinfection by Formaldehyde.—We seem to be still far from finality in the matter of disinfection. The claims of formaldehyde were strongly urged by Mr. Kenwood at the Leeds Congress. From numerous experiments made at Netley we believe that the vapour of formaldehyde offers a satisfactory means of disinfection. We have found in all our experiments that surface disinfection is thorough, and as regards penetration formaldehyde is certainly more effective than any other disinfectant yet brought before the public. We have tested its action on pathogenic and non-pathogenic organisms, such as *B. prodigiosus, B. coli, B. typhosus, B. diphtheriæ*: all these, whether as superficial colonies or cultures smeared on sterile paper, silk, cotton, and flannel, were invariably killed after 24 hours' exposure. A blanket soaked in broth culture of *B. coli* and exposed for 24 hours was also found incapable of growth, though a control simply exposed to the air grew vigorously.

Sulphur dioxide, whilst fairly efficient as a surface disinfectant when tested with *B. diphtheriæ* and *B. coli*, appeared to have no powers of penetration. Our experiments were confined to non-sporulous bacilli, because in ordinary practical disinfection it is exceedingly doubtful whether we had leave to deal with such resistant organisms as the spores of anthrax and *B. subtilis*.

Dr. Paul Rosenberg has recently given, in the *Zeitzschrift für Hygiene*, the results of his experiments with formaldehyde. He considers that it compares with steam sterilisation for efficiency, and has no injurious effect on the goods. Its penetrating action is, he thinks, quite proved. 0·05 of formaldehyde added to a litre of milk kills all pathogenic organisms and keeps it fresh. He believes there is a large use for it in dairies.

Dr. Alvah Doty, Health Officer of the port of New York, in the *American Journal of the Medical Sciences*, describes a new disinfector used on board the "James Wadsworth" engaged in the port of New York. In all disinfectors hitherto adopted it has been shown that the air confined in a closed chamber presents a considerable obstacle to the penetration of the steam into the interior of packages, such as rolls of beddings, mattresses, &c., so that the exteriors have to be exposed to a temperature of 220° F. to 230° F. before their interiors are raised to the same point, and, since the latter must be subjected to this temperature for at least fifteen minutes, the former are exposed for an excessive period and liable to be more or less injured thereby. This difficulty has now been completely overcome. This device consists in the exhaustion of the air in the chamber, so as to produce a partial vacuum before the steam is admitted, thus enabling a temperature of 240° F. to be attained in the interior of goods in less than three minutes with the vacuum, though without it from ten to fifteen minutes are required.

The oven itself is of the usual form, but with double walls, and covered outside with a jacket of asbestos, which so effectually prevents the loss of heat by radiation that the air of the room is not perceptibly warmer. The special feature, however, is the steam exhaust, which consists simply of a powerful jet of steam, which, rushing past the mouths of 1½-inch pipes connected with the chamber of the oven, reduces the internal pressure to twenty inches in less than a minute. The pipes are connected with the chamber of the oven and with the space between the inner and outer walls. The operation is conducted as follows:—

The articles to be disinfected, having been placed in the chamber and the door closed, the steam exhaust is set to work until the steam gauge indicates a pressure in the chamber of not more than 20 inches.

The valves are then closed and the steam pipe opened, when the superheated vapour entering under a pressure of two atmospheres into the rarefied atmosphere of the chamber penetrates the densest fabrics, raising their temperature throughout to its own in three or four minutes. The steaming need therefore not be continued for more than twenty minutes in all.

The steam is then shut off, and the exhaust again put in action until the steam gauge indicates the restoration of a partial vacuum of 20 inches in the chamber when the air inlet is opened and a stong current of air is drawn through, which in the course of three or four minutes removes every trace of moisture, whether derived from the steam or from the articles having been wet when introduced.

A series of experiments—19 in all—show the enormous advantage of this system. Ten minutes at 240° F. destroyed bacilli of plague and anthrax, however protected. The whole process can be completed within half an hour, and the clothing and property returned to its owners perfectly dry and uninjured.

Malarial Infection.—Laveran rejects aërial communication as improbable, and water as a possible, but unproven, vehicle. He is inclined to look on the bites of mosquitoes, &c., as the chief means of infection, as they certainly are in filaria, Texas fever, &c. All the usual precautions, as drying of the soil, avoidance of night air and of sleeping on the ground, mosquito curtains indoors, and smoky fires in camps, seem unconsciously directed against such insects.

The question whether malaria is ever a water-borne disease is discussed by Rupert Norton, who remarks that we are never able to trace a whole group of cases to a single source of infection, as those of typhoid often are, nor do we find groups arising in towns where the infection can be traced to water or milk.

While in some stations of the United States Army, where malaria was prevalent, no diminution occurred when distilled water was drunk, still a vast number of practitioners in the Southern States are convinced that malaria is frequently conveyed by water, in which Indian medical officers agree. Celli, on the other hand, shows that the introduction of a new water supply into a town did not diminish malaria, and both he and Salomone-Marius gave large quantities of water from the Pontine Marshes to patients without causing malaria. On the whole Norton concludes that the weight of proof is against the common belief that malaria can be so conveyed, and notices that in the cases where the supposed disease was clearly waterborne the plasmodium has not, so far, been found in the blood.

Earth Closets and Disease Germs.—Sinnhuher shows that pulverised garden mould, though deodorising and nitrifying organic matter, has no effect on pathogenic bacteria, such as those of enteric fever and cholera, which were found living and active after several months in moist earth. But a thorough incorporation of a small quantity of quicklime speedily destroyed the bacteria, 3 per cent. killing cholera bacilli in four hours, 4 per cent. in less than one hour, and 8 per cent. in fifteen minutes. If kept dry the lime loses its activity very slowly, and Sinnhuher recommends for earth closets a mixture containing 10 per cent.

School Hygiene.—Mr. Shirley Murphy has drawn attention to the fact that the prevalence of scarlet fever and diphtheria is largely influenced by school attendance, there being a sudden drop as soon as the holidays commence. This fall in the prevalence curve begins a week sooner in the scarlet fever than in diphtheria, and in the former extends to children above the school age, whereas in diphtheria the depression extends chiefly to infants, and in them begins a fortnight later than in those attending school. What seems to be required is a systematic medical inspection of schools, which would no doubt detect cases of infectious disease in their early stage, and cause a diminution of the spread of infection.

Hygiene of Occupations.—Dr. E. H. Snell draws attention to the peculiar form of sickness which attacks men working in compressed air. Although no fatal case occurred amongst the workmen during the construction of the Blackwall Tunnel, yet the use of compressed air has been responsible for a by no means inconsiderable number of deaths. The stay in the compressed air causes no inconvenience; one finds that it requires more muscular effort to put the air into vibration in speaking; the voice has a higher and more nasal tone, and it is difficult or impossible to whistle; except for these obvious peculiarities one does not know that anything is abnormal. But although the sojourn is, during its continuance, without apparent effect, the exit may be followed by serious illness or even death. The occurrence of this illness has been noticed since compressed air was first employed as a working atmosphere, and is analogous to the illnesses to which divers are subject. The most common form in which it appears is that of pain in the extremities. This may supervene immediately on exit or within a few hours afterwards. The pain usually affects the legs, and principally the parts about the knees, though it may be present in the arms, especially the elbows and shoulders. Its onset is usually sudden, becoming more and more severe for a short time afterwards. The pain, if slight, may pass off in a few hours, or it may last for weeks. A less common situation for the pain is the epigastrium, and this may be of great severity. Serious symptoms of collapse have been observed.

Sometimes the illness takes the form of paralysis of the legs, followed or not by the usual bladder and rectum troubles of a transverse myelitis, or again a form of acute Menière's disease may occur.

Hæmorrhage from the ears and nose has often been met with after leaving the compressed air.

So far as at present known, the three principal causes, with the variation of which the illness directly coincides, are (1) the height of the pressure, (2) the length of stay in the compressed air, and (3) the lack of ventilation of the air chamber. Other determining causes are (4) a too rapid exit, and personal idiosyncrasies. Stout men are more liable to the illness than thin men, older than younger men, and probably heavy drinkers than moderate drinkers or abstainers.

In adopting preventive measures the etiological factors have, as far as possible, to be eliminated. At Blackwall the length of the stay for the workman was eight hours with an interval for a meal of three-quarters of an hour in the middle. With higher pressure shorter hours would be necessary.

In the matter of remedies, the best method of cure is re-compression followed by a very slow exit. This remedy appears to be very effective when resorted to early; should it be delayed, little benefit is derived, and symptomatic treatment alone remains.

Foods.—Dr. E. W. Hope has investigated the milk supplies of Liverpool. He submitted 168 samples to bacteriological examination, with a view of ascertaining the presence or otherwise of the tubercle bacillus. The results obtained were exceedingly instructive; 2·8 per cent. of the 144 samples of milk taken from sources within the city and under the control of the Health Department contained the tubercle bacillus, but no less than 29·1 per cent. of the 24 samples of milk taken at the railway station on arrival from country places contained tubercle bacillus. He states that the inference to be drawn from this is strikingly conclusive, viz., that the supervision exercised in the city has proved more effectual than that which obtains in the country, and it is also made clear by the results of this examination that consumers are safer, so far as tuberculosis is concerned, with milk from city shippons than with milk sent in from the country.

The milk was tested by injecting a small quantity beneath the skin of a guinea pig, tuberculosis being produced if the bacilli were present in sufficient numbers. The probability of finding tubercle bacilli in large quantities of milk by microscopic measures was found to be extremely small.

Bardet emphasises the fact that milk is really a manufactured article, its quality dependent upon the nature of the food and the amount of care bestowed upon the cow. After many analyses he has come to regard "good country milk" as a myth, for the increased skill, care, and enforced cleanliness of the town cowkeeper results in the production of a milk very much richer and purer than that sent into our cities from the neglected and ill-regulated byres of rural districts. Town milk is either very good or very poor. In the country there is a uniformly poor standard.

Mr. Ernest Hart has collected the history of 95 outbreaks of disease traced to the agency of milk; 48 were typhoid, 32 scarlatina, and 15 diphtheria. These are in addition to the 73 outbreaks reported in 1881. He shows clearly that disease of the cow herself may render the milk infective. Whilst filth conditions generally played a part in the causation of contamination, it was more common to discover cases of infectious disease that had been concealed, unnotified, or undetected, and in more than one case there were found amongst the dairy workers persons who were in charge of sick patients. Stringy or ropy condition of milk was noted in connexion with several of the outbreaks, and the milk of cows recently calved seems especially liable to cause disease. This last is of great importance, as outbreaks of scarlet fever, diphtheria, and enteric fever have been traced to this source. Epidemics are traced to the washing of cans with filthy water, and to the admixture of water through leaks in defective cooling apparatus. Separated milk and ice creams also play a part in the causation. Amongst remedial measures the chief is boiling the milk. The milk of cows suffering from tuberculosis or from eruptive diseases and of newly-calved cows should not be sold. Compulsory notification of the diseases of cattle, increased penalties for infringement of the present law, and some regulations of the ice cream trade are also needed.

Emergency Rations is the subject of a most excellent paper on preserved articles of food in a concentrated form, read before the Association of Military Surgeons, United States, by Captain Charles E. Woodruff, Assistant Surgeon, United States Army. He points out that—

"Food articles are susceptible of only moderate condensation. The best we can do is to exclude water and indigestible portions; further condensation is impossible. A certain amount of fresh food is absolutely necessary for health. Now a ration of prepared foods can be made exactly like a ration of fresh articles in all characteristics except freshness. We can dry, concentrate, compress, and otherwise preserve food articles, and then arrange them into a field ration, so that the soldier will have the exact amount of protein, carbohydrates, fats and salts, heat, energy, weight, &c., but there are missing certain qualities whose absence will result in disease and death. In the first place a certain amount of indigestible material is necessary for the digestive organs. They are not fitted for digesting foods, all of which can be dissolved. There must be an undigested residue to keep the intestines active, and the stomach itself must have a certain bulk of material to work on or it will be inefficient. If the concentrated food is in powdered or liquid form another law of physiology is violated."

"It is essential that a portion of food should be in the solid form, so that a certain amount of mastication is performed. The movements of the jaws cause secretion of saliva, which converts the insoluble starch into soluble and absorbable sugar. Hence, if food is powdered or fluid, and mastication is not necessary, sufficient saliva is not poured into the stomach, and the starches are perhaps incompletely digested, and their subsequent fermentation in the intestines is one of the causes of the flatulence, colic, and diarrhœa which follow the continued use of such foods, as was the case in the Franco-Prussian War."

"History informs us that as long as armies have waged war in an enemy's country, military men, seeing the necessity for carrying food along, and being hampered by insufficient transportation, have tried to concentrate the food. Experiments in this line have been made from time immemorial, but they have failed, and we now see why they have failed. A scientific survey of the matter shows that success is impossible, even though we were to make concentrated food that would contain the exact amounts of the identical substances needed for fuel and repairs of tissues. The soldier's field ration should theoretically contain fresh meat, fresh vegetables, and fresh fruits, not daily, but in the ordinary variety and frequency usual with civilians of respectable standing. The nearer we approach to this state of affairs the better it will be."

"In the absence of fresh articles the field ration usually consists of bacon, hardtack, dried vegetables, coffee, sugar, salt, and perhaps potatoes, if they can be carried. Sometimes bacon, hardtack, and coffee are the sole things carried. The ration is deficient in protein, but it contains enough fats and carbohydrates, and yields sufficient energy. It cannot be used exclusively for any length of time without running the risk of lessened vitality and perhaps scurvy. Notwithstanding these defects it seems to be the least objectionable, because, after years of trials and experiments, the field ration of the principal civilised nations has crystallised into something like this shape."

The following is the emergency ration authorised for issue by the War Department, United States Army:—Bacon, 10 ounces; hard bread, 16 ounces; pea meal, 4 ounces, or an equivalent in approved material for making soup; coffee, roasted or ground, 2 ounces, or tea, ½ ounce; saccharine, 4 grains; salt, ·64 ounce; pepper, ·04 ounce; tobacco, ½ ounce.

This emergency ration is to be resorted to only on occasions arising in active operations, when the use of the regularly established ration may be impracticable; that, although its nutritive qualities permit its use on half allowance, it will not be so used except in case of overruling necessity, and never for a longer period than ten days, and that not more than five days' emergency rations be carried on the person at one time.

The paper from which the above extracts are taken is full of valuable information; it is well worthy of perusal by medical officers.

The following practical conclusions are drawn from the results of a series of experiments made by Lieut. Thomas C. Craig, Surgeon, U.S. Navy, on the liability of the cholera spirillum in its relation to certain fruit acids, and deserve the attention of medical officers, especially of those serving in the tropics and India.

(1.) That the sterile cut surface of most of our fruits is inhibitory to the growth of the cholera spirillum; some of them destroying it rapidly, others taking a longer time.

(2.) That it is a dangerous practice to sprinkle or wash the cut surface of our fruits with water infected with the cholera spirillum.

(3.) That fruits in themselves do not contain, or by growth spontaneously originate, the cholera spirillum.

(4.) That some fruits, notably the water melon and caudeloupe, offer a splendid culture soil for the cholera spirillum.

(5.) That in cholera-infected places oranges and lemons are the safest fruit to use, many acting almost as prophylactics.

(6.) That a strongly acid lemonade would be the safest drink to use in order to guard agaidst the cholera spirillum.

(7.) Never use fruit in a cholera-infected country, unless you yourself see it cut with a sterilised knife, and know that the surface of the knife is free from the cholera spirillum.

(8.) That the very common practice of exposing for sale sections of fruits, such as water melons, oranges, pine-apples, &c. floating in water, should be strictly prohibited in all countries where there are any cases of cholera.

The following is a list of the samples of the waters, foods, &c. sent to the Hygienic Laboratory at Netley for special analyses, and reported on to the War Office during the year :—

	Samples.
Water	42
Sewage effluents	4
Malt liquors	3
Butter	2
White metal	1
Iron pipe	1
Teak wood	2
Milk	12
Condensed milk	1
Cheese	1
Flour	5
Filter	1
Bread	1
Meat extracts	4
Crystallised egg	1
Mineral water	1
Gold size	1
Gold leaf	1
Disinfection apparatus	1
Total	85

The following table gives the means of the analyses of water in parts per 100,000 :—

Table of Drinking Waters according to Purity.

No.	Class of Waters.	Chlorine.	Oxygen required for Organic Matter.	Ammonia.		Nitric Acid.	Hardness.	
				Free.	Albuminoid.		Total.	Fixed.
26	Fit for use - - - -	3·5	0·040	0·001	0·005	1·040	13·3	6·3
5	Usable, but requires filtration.	3·8	0·123	0·003	0·016	1·482	7·3	6·0
11	Unfit on account of organic impurity and of excessive hardness and chlorides.	9·0	0·155	0·114	0·021	6·009	26·8	11·9

In those waters marked " Fit for use " the chlorine is above the average for this class of water; it is due to several samples having been received from seaside stations which were affected by sea-spray, &c.

A very large number of these samples were also examined bacteriologically, and in every case of a suspicious water the number of micro-organisms present were noted. In no case was any specific pathogenic organism found.

APPENDIX No. II.

LIST OF OPERATIONS PERFORMED AT THE ROYAL VICTORIA HOSPITAL, NETLEY, DURING THE YEAR 1897.

By Surgeon-Colonel W. F. Stevenson, Army Medical Staff, Professor of Military Surgery, and Surgeon-Major W. Dick, M.B., Assistant Professor, Army Medical School, Netley.

Operations.	Number of Cases.	Diseases.	Results.				Remarks.
			Completely successful.	Partially successful.	Failed.	Died.	
External urethrotomy	4	Stricture -	4	—	—	—	
Removal of carious bone.	14	Caries -	10	2	2	—	
Removal of sequestra -	12	Necrosis -	12	—	—	—	
Incision and drainage -	5	Abscess of liver -	2	—	—	3	
Do. do. -	1	Empyema -	—	1	—	—	Still under treatment.
Do. do. -	2	Chronic abscess -	2	—	—	—	
Excision of veins -	5	Varix -	5	—	—	—	
Do. do. -	1	Varicocele -	1	—	—	—	
Amputation, forearm -	1	Tubercle, wrist -	1	—	—	—	
Do. thigh -	1	Do. knee -	1	—	—	—	
Do. leg - -	2	Do. foot and ankle.	2	—	—	—	
Do. do. -	1	Sarcoma of foot -	1	—	—	—	
Do. toes -	1	Hammer toes -	1	—	—	—	After unsuccessful excision of the joints.
Resection of bones -	2	Ununited fracture	1	—	—	—	One still in hospital.
Excision of joints -	1	Hammer toes -	—	—	1	—	
Operation for radical cure.	9	Hernia, inguinal -	9	—	—	—	
Excision of glands -	13	Suppuration of glands.	9	4	—	—	
Do. cyst - -	4	Cysts, various -	4	—	—	—	
Do. tumour -	1	Sarcoma - -	1	—	—	—	Popliteal region.
Do. do. -	1	Epithelioma of lip	1	—	—	—	
Sinuses laid open and scraped.	9	Sinus, neck, groin, &c.	9	—	—	—	
Dilatation of sphincter and ligature.	4	Piles - -	4	—	—	—	
Excision of eye-ball -	1	Panophthalmitis	1	—	—	—	

Operations.	Number of Cases.	Diseases.	Results.				Remarks.
			Completely successful.	Partially successful.	Failed.	Died.	
Plastic operation -	1	Defect of urethra	—	—	1	—	
Castration - -	4	Tubercle of testicle	4	—	—	—	
Scraping - - -	1	Lupus of face -	—	1	—	—	
Removal of appendix -	2	Appendicitis -	1	—	—	1	
Circumcision - -	1	Phimosis - -	1	—	—	—	
Division of nerve -	1	Painful stump -	1	—	—	—	
Total - -	105	Total -	88	8	4	4	

Notes on Operation Cases and others.

Ununited fracture of the femur.

Sergt.-Major C., 17th Lancers, aged 32, sustained a simple fracture of the femur, at York, on 25th April 1896, from his horse falling and partially rolling over him; the fracture occurred a little above the junction of the upper and middle thirds. The limb was put up with the long Liston splint and a perineal band. After eight weeks only fibrous union had taken place, the bone was much enlarged, and one inch of shortening had occurred; the splint was reapplied. In September 1896 the union was still fibrous, and the man was transferred to Netley for further treatment, arriving here on the 30th of that month. On 4th October the fibrous adhesions were broken down under an anæsthetic, the ends of the bones well rubbed together, and the limb put up with Gouch splinting to the thigh, and extension applied by weights to the leg by a cord over a pulley at the foot of the bed, which latter was raised off the floor about a foot. On 27th November no union had occurred, and the limb was put up in plaster. This was removed on December 15th, but no improvement had taken place.

As the ordinary methods of treatment did not appear to be likely to succeed, the man was recommended to consent to an operation for wiring the ends of the bone together, which he did. A special iron splint was prepared extending from the tuber ischii to the middle of the leg, and having part of the thigh piece on hinges to give access to the site of the proposed incision on the outer side. The operation was performed on 1st January 1897; no Esmarch's tube or bandage was used, the vessels being clipped and tied as they were cut. An incision, 7 inches long, was made over the bone where it felt most superficial on the outer and upper surface, a good deal of hæmorrhage occurring at its upper end. The ends of the bone were found to be overriding to the extent of about 1½ inches, the lower end of the upper fragment being in front, and they were strongly united by fibrous tissue. The fracture was directly transverse. Very great difficulty was experienced in refreshing the ends of the bones, but this was eventually done, about an inch of bone being removed in all. A thick silver wire was passed through the outer surface of the bone, the fractured ends got into good apposition and the wire twisted and cut short. It was then found that blood was coming rapidly from behind the sutured ends of the bone and pressure did not stop it. The wire had to be removed, but no bleeding point could be seen, and the oozing continued. Very hot irrigation was used, and the wire replaced in the hope that the pressure of the dressings and bandages would control it. A small drainage tube was put in at the situation the blood was coming from to prevent accumulation within the limb and to indicate the hæmorrhage if it continued. The hæmorrhage did continue, and at 3 p.m. the man was in an extremely critical condition; the sutures in the incision were then removed and the wound firmly packed with double cyanide gauze, and no more bleeding occurred. T.=98° F. at 9 p.m.

On the next day at 11 30 a.m., under an anæsthetic, the gauze packing was gently removed from the wound, and the latter resutured, no bleeding taking place; dry cyanide gauze and wool dressing were applied, the limb well elevated on pillows to release the tension of the psoas and iliacus muscles on the upper fragment, and a 4 lbs. extension weight put on. Evening temperature=99·3° F., pulse=120, and very weak. The patient soon recovered from the loss of blood and the shock of the operation, and the wound ran a perfectly aseptic course.

On 24th day after the operation the man reported that he had moved during his sleep and "felt something give in his thigh," and on examination it was found that deformity, which until then had been absent, had again taken place, the upper fragment being displaced forwards; this was rectified by means of Gouch splinting. On Feb. 19th the bones seemed to be in good position, but no bony union had occurred, nor had any improvement taken place by April 1st.

Mr. William Rose, of King's College, at the suggestion of the officers of the man's regiment saw the case in consultation on 7th April, and recommended the application of a plaster apparatus for six weeks. This was put on, but no true union resulted, and the limb was again put up in plaster. The second plaster apparatus was removed on July 14th; no union had taken place and there was shortening to 2 inches. A skiagram taken at this time showed the bones overriding, the upper fragment in front. As it appeared to us to be evident that the failure in this case was probably due to the breaking of the wire on the night of the 24th day after the operation, we recommended a second operation, stronger wires to be used; this was performed on July 20th, 1897.

The broken ends of the bone were laid bare by a 7-inch incision through the old cicatrix, and were found to be overriding to the extent of an inch; the wire was broken. The ends were refreshed by means of a hammer and chisel and a chain-saw. The tendency of the upper fragment to come forward was most difficult to overcome. Two very strong silver wires (No. 16 standard wire gauge) were passed, one on the anterior and the other on the outer surface of the bone, the fragments got into exact apposition and in contact, and the wires given 1½ turns. Only one or two small vessels required ligature, but there was considerable oozing of blood and serum from the periosteum and from the soft parts of the thigh, which were very œdematous: no drain was used. The operation was performed on the man's bed in order to avoid the movement which would occur in transferring the patient from an operating table to his bed.

Fresh dressings had to be applied in the evening in consequence of the oozing of blood and serum which had occurred. T. =100·4 F. On the third day after the operation the temperature was normal, the oozing had ceased, and the drain was removed.

The wound followed an aseptic course, and was soundly healed in 12 days. On 6th August the bones felt to be in end-on apposition and the femur in perfect alignment.

On 12th September the limb was put up in plaster, and the man was sent out daily into the hospital grounds on a wheeled stretcher. While applying the plaster apparatus the union in the femur appeared to be firm, but not very much attempt to settle this question was considered justifiable, and it remains doubtful. The plaster case is still on.

Resection of radius and ulna.

Private J. H., Royal Highlanders, fell from a ladder a distance of 10 feet on the 25th March 1896; his right arm doubled up under him, and he sustained a compound fracture of the right radius and ulna. The wound healed, but the bones only united by fibrous tissue. He was admitted into hospital at Netley from India on 14th November 1896. There was then considerable motion at the seat of fracture, in the middle third of the forearms, and the hand was practically useless. On 8th December 1896 he was put under ether, and linear incisions were made on the radial and ulnar sides of the forearm; the bones were turned out through the wounds on their respective sides, the fibrous union was cut through, and the ends of each bone sawed off until healthy bone tissue was exposed. The sawn ends of the radius were then drilled, and strong silver wire passed through the drill holes. The ulna was treated in a similar manner. The bones were then accurately adjusted in position, and the respective ends tied together. The forearm was then laid on a straight anterior splint, and a smaller splint laid on the dorsal aspect, this latter being moved when the wounds were dressed. The wounds healed rapidly. Osseous union took place between the ends of the bones, and after practice the arm became quite useful. The bones remained in good position, and the man was discharged to duty on the 24th April 1897 with strong bony union.

Relapsing appendicitis.

Private A. T., aged 19 years, was transferred from an out-station in August for further treatment. He had had three relapses of appendicitis in seven months, and a return to anything like solid food always brought on pains in the right iliac region and rise of temperature. Removal of the appendix was accordingly recommended, and the man was sent here to have the operation performed. On arrival at Netley he was quite convalescent from the last attack; he had no pain, the temperature was normal, and the bowels acted regularly. On examination a distinct fulness in the right iliac fossa was to be felt, and on deep pressure a tumour, extending from 1 inch outside the umbilicus to within an inch of Poupart's ligament, was made out, just over the region of the cæcum. This tumour was not prominent, and was only to be felt deeply in the abdominal cavity; the percussion note over it was not dull. The case was evidently one of relapsing typhlitis or appendicitis, and surgical interference was decided on. The operation was performed on 10th September; a 3-inch incision was made in the direction of the fibres of the external oblique and a little outside McBurney's point; this was afterwards extended upwards and downwards to 6 inches. Firm adhesions were found between the cæcum and omentum, and between the former and the neighbourhood of Poupart's ligament. The appendix was found under the lower end of the incision; it was thickened and red in appearance; for about an inch from the cæcum it was free of abnormal adhesions, but its outer end was firmly attached, apparently, to the brim of the pelvis, on the way to which point it made a complete turn round a strong band of tissue; the cæcum was much thickened, red and velvet-like on its outer surface. In gently breaking down the adhesions of the cæcum to the abdominal walls, two circular apertures were made in it, opening the lumen of the bowel, one nearly half an inch and the other a quarter of an inch in diameter, a drop or two of liquid fæcal matter escaping, which was immediately mopped up. Flat sponges were used to shut off the abdominal cavity from the site of operation. Both apertures in the cæcum were closed, each with one row of sutures of the thinnest silk, six Lambert stitches being placed in one and four in the other. The edges of the rents in the intestine were dark coloured, and the tissue soft and pliable, having all the appearance of being the bases of ulcers within the lumen of the gut. The lines of suturing were washed with 1—40 carbolic lotion, and had a little dry iodoform rubbed in. The appendix was then sought for and found as above described. Its deep attachment was freed, and a circular ligature of silk placed on it close to the cæcum; it was then removed at less than a quarter of an inch from the ligature, its lumen scraped out and disinfected, and the serous membrane sutured together over the end of the stump, iodoform powder being rubbed on. The incision was then closed with silkworm gut sutures through all the tissues of the abdominal walls entering the skin more than an inch from the edges of the incision, horsehair being used to bring the skin wound into accurate apposition. Iodoform and boracic acid powder were freely dusted over the wound, and dry double cyanide gauze and wool dressings applied. No irrigation or drainage was employed. At 6 p.m. the temperature was 100·0° F., and at 10 p.m. 99·0° F., after which it remained normal or subnormal. The case made an uninterrupted recovery; one stitch-abscess formed; flatus was passed on the second day, and the bowels were moved on the seventh day by means of a glycerine enema. The wound was soundly healed, and all the sutures removed on the fourteenth day.

Case of typhlitis.

Private G. W., aged 29 years, was admitted into Jullundur Station Hospital for typhlitis in November 1896, on recovery from which complaint he was sent home as an invalid, and arrived at Netley in April 1897. On admission here he was a fairly well-nourished man, but was almost confined to his bed in consequence of pain and tenderness in the right iliac fossa; the temperature was normal, the bowels were confined and difficult to move; the abdomen was somewhat distended, and there was a tumour in the region of the cæcum, over which the percussion note was not dull. The tumour extended from the umbilicus to the crest of the ilium. No improvement took place in his condition during a month's stay in hospital, and an operation for removal of the appendix and drainage of an abscess, if one existed, was recommended. This was performed on May 5th. A 5-inch incision was made over the tumour, parallel to and about 1½ inches from Poupart's ligament. Thickened omentum first came into view; this was adherent to the cæcum and appendix, as well as to the ileum at its entrance into the large intestine, and partly to the abdominal wall. In fact all these structures were so matted together as to be recognisable only with difficulty and when some of the adhesions had been separated. These adhesions were easily broken down, and when this was done and the appendix freed, the latter was removed below a circular ligature of silk, the stump being disinfected with 1–40 carbolic lotion and iodoform. Between all the adherent surfaces there was a layer of lymph and pus; this was gently wiped away with aseptic pledgets of wool wrung out of weak carbolic lotion and the parts irrigated, a glass drainage tube being passed deeply into the pelvic cavity. The operation lasted over an hour. In the evening the patient's condition was not satisfactory; the pulse was 92, and intermittent; he was restless and had severe hiccough. T.= 99·2° F.; there was no pain or distension of the abdomen. On the second day no improvement had taken place; he was flushed and anxious in appearance, and suffered from constant hiccough. Pulse 104, small and of low tension; T.= 98·0° F.; respirations 30. There was neither pain nor abdominal distension. These symptoms continued and became more marked; he steadily became weaker, and he died of exhaustion on fourth day. No action of the bowels occurred and no flatus was passed, notwithstanding the use of turpentine enemata; he suffered no pain, and the abdomen did not show any distension, nor was it tender on pressure. The temperature varied between 98·0° F. and 101·0° F. until shortly before his death, when it rose to 103·0 F.

No general post-mortem was allowed, but a partial examination of the abdomen was permitted, and the following conditions were found to exist. There was peritonitis in the right iliac fossa, the pelvic cavity, and especially in the recto-vesical pouch. The cæcum showed dark discolourations, dilatation, and thinning of its walls. The cæcum was matted together with the lower end of the ileum, the omentum, and the remains of the appendix into an undistinguishable mass, with layers of purulent lymph between the adherent portions. The lower end of the rectum, immediately above the sphincters, was much dilated and empty; above this the bowel made a complete S-shaped flexure; this portion was empty, its serous surfaces being so adherent to each other as to obliterate the lumen of the intestine, and cause complete obstruction. This latter condition, combined with the peritonitis and consequent septic absorption, was evidently the cause of death, but at no time after the operation was the man's condition such as would have warranted further surgical interference.

Abscess of the liver.

Five cases of this complaint were admitted and operated on, with three deaths, an unusually high death-rate according to our experience here for cases in which the abscess has been reached by surgical interference. In two of the fatal cases there was a history of previous dysentery, and in the other one of diarrhœa, which continued on the voyage home and at Netley. In all of these there were more than one abscess, and in one a second abscess was opened and drained in the centre line below the costal arch. In one the liver weighed 90½ ozs., and was studded with abscesses, large and small. Two cases made perfect recoveries, but were discharged the service as unfit to go abroad.

The usual method of operating was employed in all the cases; where an abscess was suspected an aspirating needle was passed in at one or more situations, under an anæsthetic, until pus was reached. An incision was then made and the contents evacuated, a piece of rib being excised when the intercostal space appeared to be too narrow to admit of free drainage. The incision was made as near the mid-axillary line as possible, and two large tubes inserted; the abscess cavity was usually irrigated for the first few days with iodine water (1 drachm of the tincture to a pint of boiled water) or with weak carbolic lotion.

Cases of external urethrotomy.

There were four cases, all of which were successful. The following is a type of the cases. Private J. W., 2nd Derby Regiment, was admitted into hospital at Sitapur, in January 1897 suffering from an abscess in the perineum. He had had numerous admissions for gonorrhœa. There was also a urinary fistula in front of the scrotum. He was admitted into Netley Hospital on the 14th April 1897. He then had a long indurated stricture stretching from the front of the stricture backwards; there were two fistulous openings, one at site of stricture and one behind the scrotum, through which urine passed. On the 12th June 1897, under chloroform, the anterior portion of the stricture down to the anterior fistula was divided on a probe, the posterior portion was similarly divided on a probe, passed from the fistula. A No. 11 catheter was then passed into the bladder. The case went on well, and on the 27th July 1897 he was discharged to duty, passing a No. 11 catheter occasionally.

Excision of veins.

Five operations for varicose veins were performed during the year, all the men returning to duty quite fit. In all of them the same operation was performed, viz., the men were made to stand up so that the veins became distended, then the veins were marked out with indelible pencil. Under an anæsthetic from 12 to 18 incisions, each about 1 inch long, were made, the vein dissected out, ligatured in two places, and the intervening portion cut out. The incisions are sewn with horsehair, and dry dressings applied. In 10 days the dressing is taken off and the wounds are usually healed.

Varicocele.

Corporal L. T., 20th Hussars, was admitted into Netley Hospital on 2nd January 1897, with a large left varicocele, which had been operated on in India, by the subcutaneous method, but without success. On the 19th January 1897 he was placed under chloroform, and an incision, 1½ inches long, made high up over the abdominal ring, the cord exposed, the veins separated from the vas, and two ligatures tied round them, about 1 inch apart. The intervening portion of the veins was then cut out. The two ligatures were then tied together. The incision in this method is in the inguinal region, considerably removed from the scrotum, and is therefore very easily kept aseptic. The wound healed without suppuration, the varicocele was completely cured, and the man returned to duty on the 27th February 1897.

Radical cure of hernia.

Nine operations for the radical cure of hernia were performed on eight men, one man having two operations performed, one on each side. All the men were discharged to duty, the operations being completely successful. The most interesting of this series was Private R. E., 1st Devonshire Regiment.

On a field day in December 1895 he stated that he strained himself, jumping over a ditch; about two days afterwards a lump appeared in the right groin; it was not attended with pain and he did not report it. In July 1896 a smaller lump appeared in his left groin. Both herniæ grew gradually larger and entered the scrotum; they remained easily reducible. He was invalided home from India and admitted into Netley Hospital on 14th November 1896. He then had a large scrotal hernia on each side, which were easily reducible, but totally prevented him doing his duty.

On the 29th November he was put under chloroform and the right hernia operated on. An incision, 3½ inches long, was made along the direction of the inguinal canal; the pillars of the ring were defined and the sac found and separated from the cord. The sac was opened, but it was found that there was a septum, cutting off this distal portion from the proximal; the sac was then opened higher up, ligatured at its neck and cut off. The fundus of the sac was not dissected out. The conjoined tendon and Poupart's ligament were then brought together with salmon gut, the superficial ring stitched together with catgut, and the skin with horsehair. The wound healed by first intention without rise of temperature. On the 23rd December the left hernia was operated on in precisely the same manner, except that the sac, which was very large, was dissected out and entirely removed. The same evening some hæmorrhage took place, which necessitated the wound being opened up and enlarged. A large clot was turned out, and one or two small bleeding points secured and ligatured. The bleeding having now stopped, the wound was stitched up again. The wound healed rapidly without a bad symptom and with no rise of temperature. On the 6th February 1897 the man was discharged to duty perfectly recovered.

Amputation through lower third of forearm.

Driver C. P., Royal Artillery, fell downstairs on the 26th October 1896, and twisted his right wrist. Inflammation of the wrist set in, and ended in disease of the joint, all the carpal bones and the four external metacarpal bones becoming carious. Various incisions were made on the dorsum of the hand in India. He was invalided home, and admitted into the Royal Victoria Hospital, Netley, on 18th March 1897. The hand was then very much swollen, and the dorsum was riddled with sinuses, discharging putrid pus and leading down to dead bone. On the 16th April incisions were made into the back of the hand, and a considerable amount of dead bone removed; as the man had not given his consent to amputation, although the wrist and carpal joints were found to be completely disorganised and the hand quite useless, it was dressed antiseptically and put on a splint. On the next day, 17th April, the man having now given his consent, amputation through the lower third of the forearm was performed, by anterior and posterior square skin flaps with circular divisions of the muscles. This resulted in a most useful stump. The flaps united all but a sinus, which remained for a considerable period and which was found to lead down to a ligature. Otherwise the man made a good recovery, was fitted with an artificial hand, and discharged from the service on the 31st August quite well.

Amputation through middle third of thigh.

Sergeant F. B., Royal Artillery. Early in 1897 he hit his right knee, and injured it slightly; the knee became swollen and painful, and he went into hospital at Gibraltar on February 4th. The disease was diagnosed as synovitis. Although the man is described as having a phthisical look, no actual disease was found in the lungs. The knee under treatment got no better, and he was invalided home and admitted into the Station Hospital, Portsmouth, 25th April, as he was too ill to be sent on to Netley. Under rest and tonics he improved somewhat and was transferred to Netley on 20th May. On admission he appeared phthisical and very much wasted, the apices of both lungs were consolidated, and he had a slight expectoration, which on examination showed numerous tubercle bacilli; the right thigh and leg were nearly skin and bone; the right knee was very much swollen, fluctuation was markedly present, and this extended up the thigh under the quadriceps, especially on the inner side. He had hectic fever, and the case was evidently one of tubercular disease. For a considerable period the expediency of operation was doubtful, however, as he was getting worse, amputation at the lower part of the middle third of the thigh was performed on the 13th July. This was done by a long anterior flap, nearly all skin, the subjacent muscle being diseased, and a short posterior flap of skin and apparently healthy muscle. The knee joint was found full of grumous material, the cartilage over both the femur and tibia being nearly all destroyed. Outside the joint, and extending up the inner side of the femur, which was eroded, was a large cavity filled with material similar to that in the knee-joint. The material in both places contained tubercle bacilli. Since the operation the hectic has disappeared, as also has the expectoration, although the dulness at the apices still remains. The wound healed up without suppuration, and the man has greatly improved in general health. The man is now only waiting to be fitted with an artificial limb; he has put on flesh, and will be discharged from hospital in a few days.

Amputation through upper third of leg.

Private T. R., 2nd Durham Light Infantry, was invalided from India and admitted into Netley Hospital on the 14th November 1896. His history was as follows:—In March 1896 he contracted enteric fever, and during its course gangrene of the left foot supervened. Early in May an amputation through the tarsus was performed without an anæsthetic. At the end of the same month a sequestum was removed from the stump. In June an abscess was opened in the calf and dead bone was found here also. On arrival at Netley he was a weakly, strumous-looking man, with extensive necrosis to be felt in the stump, and also higher up the leg in the tibia. On the 18th November amputation, two inches below the tubercle of the tibia, was performed by long anterior flap (Teale).] [The case did well until the 14th January, when an abscess formed in the stump long after it had healed. This was opened, but no dead bone could be felt. This healed up, but shortly after it healed he began to complain of pain in the stump, especially at the two extremities of the cicatrix. No medicinal treatment relieved this. He was supplied with an artificial limb, fixed on to the flexed knee. When he attempted to wear this the pain became unbearable; it was also always worse at night. It was evident that some nerve filaments were in the contracting tissue of the cicatrix, accordingly on the 14th June 1897 incisions were made at both extremities of the cicatrix and the tissues divided laterally. These wounds healed up in a few days, and he never had any return of the pain, sleeping well at nights. He was discharged from the service on the 9th July 1897, his general health being good.

Amputation through lower third of leg.

Sergeant A. W. S., Medical Staff Corps, was invalided from Barbadoes with a sarcoma of the left foot. On the 12th November 1894, while on board ship, he slipped and fell on the floor of a cabin. Two days afterwards he noticed a slight diffuse swelling in the sole of the left foot; he suffered very little from this. At the end of January 1895 he slipped again, and again hurt his left foot. During the summer months of 1895 he noticed, if he walked much or played cricket, this foot pained him. The swelling in the sole of the foot did not get much bigger; he, however, had pain and occasionally inability to take any exercise. He was taken into hospital in October 1896 and was sent home, arriving at Netley Hospital on the 11th November 1896. On admission he had a tumour in the sole of the left foot about the size of a small orange, more pronounced on the inner than the outer border, the tumour was quite fixed to the deep tissues, but the skin was not adherent. On the 14th December the tumour was cut into and found to be sarcomatous; it was then decided to amputate the foot. This was done by an oval incision, preserving the point of the heel (Guyon's operation), the tibia and fibula being sawn through two inches above the ankle joint. A very excellent stump resulted. The tumour was firm at its periphery, and gelatinous towards the centre; microscopic examination showed it to be a spindle called sarcoma. The wound healed well, and he was fitted with an artificial limb and discharged from the service on the 18th February 1897 quite well.

Amputation at junction of lower and middle third of leg.

Private R. B., Somersetshire Light Infantry, was sent home from India, and arrived at Netley on the 14th April 1897. He had a long history of syphilis. On arrival here he had a very much enlarged and swollen right ankle joint, with evidently some fluid external to the joint; this was drawn off by a hypodermic syringe. The ankle continued swollen and very painful, and hectic fever set in until he became very much exhausted. On the 25th May it was determined to amputate, as the only means of saving his life. He was put under chloroform and amputation through the junction of the lower and middle thirds of the right leg performed in the following manner:—A long posterior flap of skin and muscle was made, and a very short anterior one of skin only, the bones sawn through, and then the posterior tibial nerve was dissected out of the posterior flap and cut off, to obviate the pain which would result from pressure on it. The flaps were brought together both by deep stitches and by superficial sutures. From the day of the operation, the temperature fell, and he convalesced steadily, put on flesh, and became quite healthy. By this amputation a well-padded stump, with an anterior cicatrix, well out of the way of pressure, was produced. He was fitted with an artificial limb, and was discharged from the service in a good state of health on the 14th September 1897.

Death from chloroform.

We regret to have to report a fatality of this kind during the year. Private B., a healthy man of 21 years of age, was about to be operated for the closure of a urethral fistula. Methylated chloroform was being administered on a square of lint. When he had inhaled the anæsthetic for five minutes the patient became excited and violent, and the chloroform was removed from his face; the pupils dilated, the respiration became stertorous, and the face pallid; the pulse ceased to be perceptible, and the respirations stopped, and in this order of sequence. Artificial respiration was immediately performed, and the breathing recommenced, but the heart failed to react to the usual means of treatment for syncope, injection of ether, electricity over the root of the neck and the heart, hot wet cloths over the precordium, artificial respiration, &c.,

and the man died. In this case death evidently commenced by interference with the action of the heart. No post-mortem was allowed, but the heart sounds were found to be normal before the inhalation was begun. ʒ iii. of chloroform only were expended.

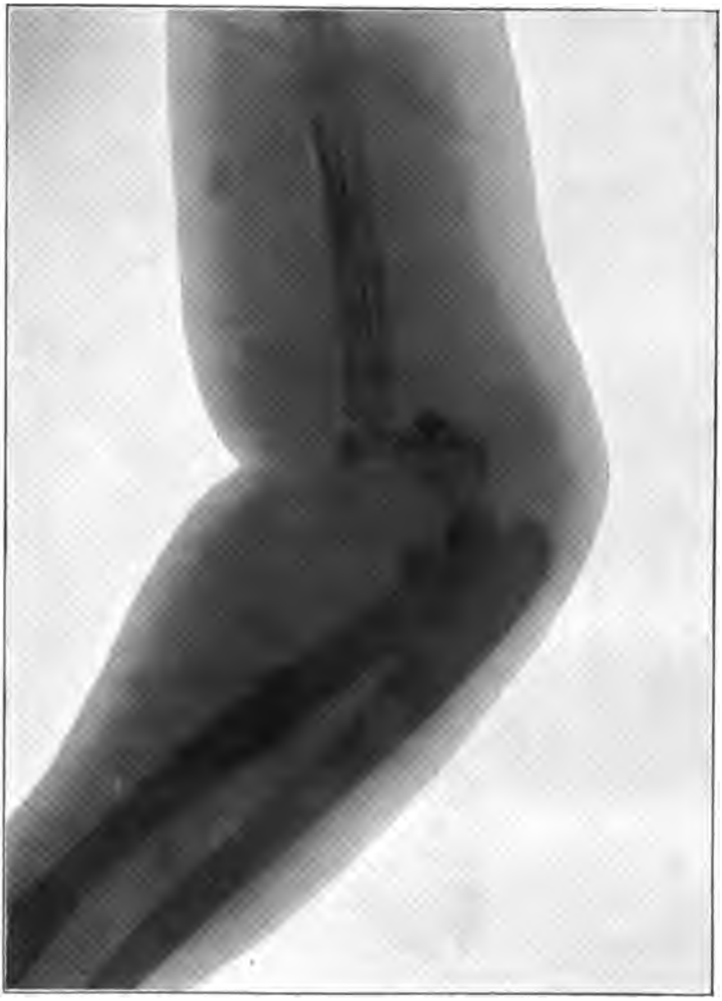
Röntgen rays.

The necessary apparatus for taking skiagraphs was supplied to the hospital last year, and has proved most useful, both for the diagnosis of recent fractures, and for the purpose of determining the necessity or advisability of operation in cases of badly united fractures of old standing.

The three accompanying skiagraphs* show how useful Röntgen ray photographs are in the treatment and diagnosis of fractures. Two are of a recent fracture of the lower end of the humerus in a child of six years, and demonstrate very clearly the effect of flexion of the elbow in rectifying the mal-position of the fragments, and in bringing them into close apposition. The third is a skiagraph of the foot of a man in whom fracture of the first phalanx of the great toe had been diagnosed by the usual means, but in which the *X* rays showed fractures of two (possibly three) other bones of the foot.

---

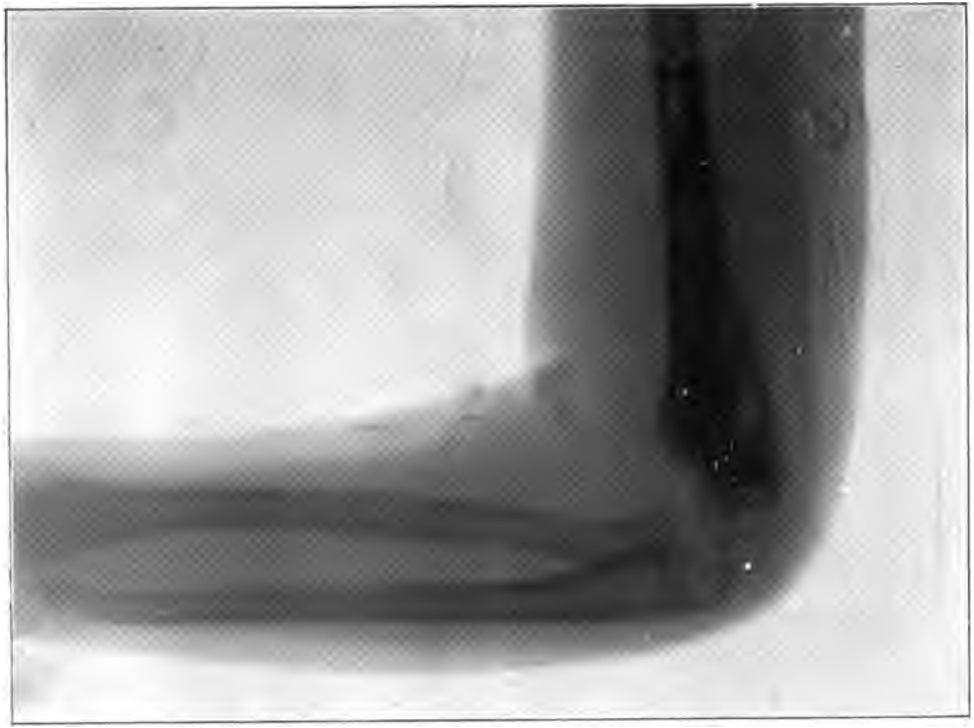
* It may be noted that many essays and theses received in the Army Medical Department from officers of the Army Medical Staff have been illustrated by this method.



Fracture of lower end of Humerus in child aged 6 years, 24 hours after accident.

Exposure = 45 seconds, with "Collar-Dean" Tube.

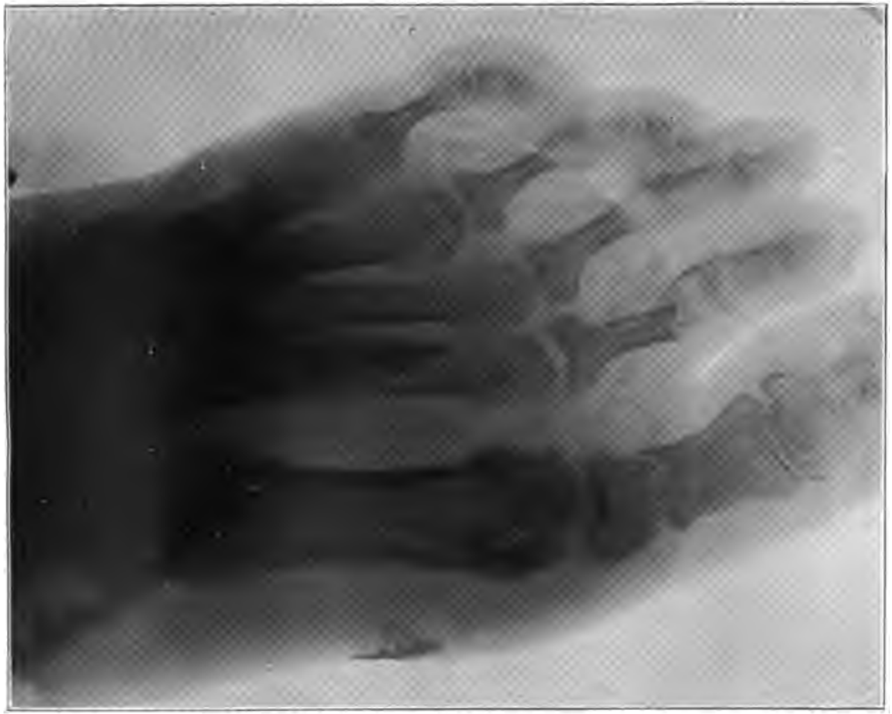
To face page 350. (2)



Union after Fracture of lower end of Humerus in a child aged 6 years, 3 weeks after accident.

Exposure = 2 minutes, with "Collar-Dean" Tube.

To face page 350. (3)



Fractures of 1st and 2nd Phalanges of great toe, and of 1st Phalanx of 2nd toe, and of 2nd Metatarsal bone.

Sergt. B. M.S.C. Exposure = 6 minutes.

APPENDIX No. III.

GENERAL REPORT OF THE MEDICAL HISTORY OF THE CHITRAL RELIEF FORCE.

By Surgeon-Major-General T. MAUNSELL, C.B., Army Medical Staff, late Principal Medical Officer, Chitral Relief Force.

Mobilization.

1. Orders having been issued for the mobilization of the 1st Division of Field Army about the middle of March 1895, the troops comprising the same were concentrated in camp soon after at Nowshera, and by the end of that month had arrived at Hoti Mardan, our frontier line, under the command of Major-General Sir R. Low, K.C.B., fully equipped and ready to take the field.

Strength and title of force.

2. This force, some 14,000 strong, was designated the "Chitral Relief Force," and was composed as follows:—

Organization. Composition of field force.

1st Infantry Brigade.

1st Battalion, King's Royal Rifle Corps.
1st Battalion, Bedfordshire Regiment.
15th Sikhs.
37th Dogras.

2nd Infantry Brigade.

1st Battalion, Gordon Highlanders.
2nd Battalion, King's Own Scottish Borderers.
4th Sikhs.
Guides Infantry.

3rd Infantry Brigade.

2nd Battalion, Seaforth Highlanders.
1st Battalion, East Kent Regiment.
26th Punjab Infantry.
2nd Battalion, 4th Gurkhas.

Divisional Troops.

Guides Cavalry.
11th Bengal Lancers.
13th Bengal Infantry.
23rd Pioneers.
No. 15 Field Battery.
" 3 British Mountain Battery.
" 8 British " "
" 4 Native (Hazara) Mountain Battery.
" 1 Company Sappers and Miners.
" 4 " " "
" 6 " " "

Composition of lines of communication.

Lines of Communication.

1st Battalion, East Lancashire Regiment.
20th Punjab Infantry.
30th „ „
No. 2 Derajat Mountain Battery.

Departmental Units.

Engineer Field Park.
Ordnance „ „

Force to be lightly equipped.

3. Before the force left Nowshera it was ordered that all tents except those required for the sick should be left behind; also, that non-commissioned officers and men should move to the front on a 10 lb., and officers on a 40 lb. kit.

Brigade field hospitals.

4. The following field hospitals accompanied the force :—

1st Infantry Brigade.

No. 1 British Field Hospital.
„ 14 Native „ „

2nd Infantry Brigade.

No. 2 British Field Hospital.
„ 35 Native „ „

3rd Infantry Brigade.

No. 8 British Field Hospital.
„ 19 Native „ „

Divisional Troops.

No. 4 (Sections A and B) British Field Hospital.
„ 17 Native Field Hospital.
„ 18 „ „ „

Field hospital for lines of communication.

Lines of Communication.

No. 4 (Sections C and D) British Field Hospital.
„ 24 Native Field Hospital.

For Sick and Wounded returning from the Front.

No. 5 British Field Hospital.
„ 6 „ „ „
„ 28 Native „ „
„ 29 „ „ „

Advance on and storming of the Malakand pass, 3rd April.

5. At 9 a.m., 3rd April, the troops comprising the 1st and 2nd Brigades, and 3 mountain batteries, advanced to the attack, and by 2 o'clock p.m. the pass was stormed and carried.

Medical arrangements for.

6. As the Brigadier-General Commanding explained to the Senior Medical Officer (Surgeon-Lieutenant-Colonel W. Donovan) that it was not desirable to encumber the force with too many baggage animals, but as it was intended to bivouac on the summit of the pass, some shelter for the wounded was a matter of necessity. Accordingly a light field hospital each, for British and native troops, including two tents, blankets, and stores of various kinds, amounting in all to seven mule loads, were arranged for and taken up next day.

7. On the morning of the 3rd April, as soon as the foot of the pass was reached, instructions were received by the Senior Medical Officer as to the general position which would be taken up by the troops, and every effort was made by the latter officer to bring the hospitals as near to them as possible. The pack mules and dandies were accordingly pushed along the nullah, or river bed, just below where the troops had begun the ascent of the heights held by the enemy. Wounded soon began to come in, and a sheltered spot in this nullah was accordingly selected as a dressing station.

8. As the regiments engaged had scattered over a wide area, it was at once seen that the regimental medical officers could not possibly render assistance to everybody requiring it, accordingly the dandies were divided into two parties under Surgeon-Captains Birt and Dowse, A.M.S., and sent out in different directions to render what help they could.

9. Early in the day the plan of operations was altered in so far that the 2nd Brigade was ordered to return to Dargai after the action, leaving the 1st Brigade to hold the pass that night; consequently, as soon as the dandie parties came in with the wounded, they were sent back to the field hospitals at Dargai, some 2½ miles distant, with instructions to the medical officer accompanying them to return the empty dandies as soon as possible to the foot of the pass.

10. During the latter part of the day, owing to a large influx of the baggage animals of the 1st Brigade, which were trying to cross the pass, the narrow track became completely blocked, and, movement in any direction being rendered well-nigh impossible, the carriage of the wounded to the rear was attended with extreme difficulty and risk. By the almost superhuman efforts, however, of the medical officers, ably seconded by the medical warrant officers and establishment, all the wounded were brought in to the dressing station in the first instance, and eventually to their permanent destination for the night.

11. The Senior Medical Warrant Officer, who had been left in charge of No. 2 British field hospital at Dargai (Assistant Surgeon Henry Holmes), made all the necessary arrangements at the hospital for the reception of the British wounded, and similar arrangements were likewise made for those of the native troops.

Casualties.

12. Our loss at this action at the Malakand consisted of :—

British Troops.

Killed—7 non-commissioned officers and men.
Wounded—3 officers, 26 non-commissioned officers and men, 15 of the latter seriously.

Native Troops.

Killed—1 man. Wounded—15.

13. The 1st Brigade held the pass for the night, and next morning pushed on for Khar, but without the field hospitals, which were unable to ascend the pass, the road being impassable. The 1st Brigade hospitals therefore encamped for the night at the foot of the pass and sent out a bearer company to further search the ground, bringing in two officers, 14th Sikhs, and one man, Gordon Highlanders. Great difficulty was experienced in bringing in these, as was the case with the other wounded, owing to the unsuitability of dandies for rough, rocky, hilly ground.

Dandies unsuitable for mountain warfare.

14. The results of these arrangements were most satisfactory, all the wounded being well cared for despite the difficulties, and reflect the greatest credit on the Senior Medical Officer and the staff at his disposal. Owing to the difficulties encountered, and to the very limited amount of space available, the 1st Brigade hospitals, while advancing up the stony river bed, got almost inextricably mixed up with each other and with regimental transport of all kinds, and much time and examination was necessary to separate them, owing to the boxes not being conspicuously marked on sides and ends.

Affair near Khar 4th April.

15. On the evening of the 4th the 1st Brigade, after a short action, in which the enemy only offered a brief and ineffectual resistance, occupied Khar. The

Casualties.

day's casualties consisting of 1 officer, 37th Dogras, slightly wounded, 2 men killed, and 11 wounded.

Occupation of Khar, 5th April.

16. The 1st Brigade British field hospital, left Dargai on the 4th, and reached Khar on the 5th, but the native field hospital contrived to get to the top of the pass in time to move off with the brigade in the morning, and render assistance during the action on the road to Khar.

17. The 2nd Brigade advanced from Dargai to the top of the Malakand on this date, and reached Khar early on the 5th. The Brigade British field hospital, which left Dargai at 6 a.m. on the 4th, only rejoined the brigade on the evening of the 5th, owing to the track over the Malakand being still blocked; but that part of the hospital provided with camel transport did not rejoin until the 8th, by which date the road had been made practicable. On this date the 2nd Brigade left Khar for Aladand. Up to this, notwithstanding the hardships and exposure to which the troops were exposed, there were very few admissions to hospital except for wounds and venereal.

6th April.

Crossing of the Swat River. Chakdara occupied, 7th April. Casualties.

18. On the 7th April the Swat river was reached and forded after some resistance and the village of Chakdara occupied. One man was severely wounded in the shoulder. A bearer party under Surgeon-Captain Dowse was present.

Want of transport conservancy establishment much felt.

19. Owing to the fouling of the ground by the large number of transport animals for which no conservancy establishment had been supplied, the camp at Khar was shifted to fresh ground one and a half miles farther on. This want of a conservancy establishment or sanitary corps of some sort to keep the camps in proper order, bury dead animals, and perform many other sanitary duties, was now much felt.

Advance of 2nd and 3rd Brigades, 10th April.

20. On the 10th of April, the 2nd and 3rd Brigades advanced, and Sado was reached by the former on the 11th and by the latter on the 12th. These two long marches between Chakdara and Sado were exceedingly hard and trying, nevertheless, very few men fell out on the way, and there were no serious cases admitted to hospital; some few men did, however, fall out some two or three miles before the column reached Sado, and, seeing how much the Kahars had to contend with in carrying even the empty dandies, sought the riding animals belonging to the field hospitals which should be available for such cases.

Sado occupied, 12th April.

Affair at the Punjkora river, 13th April.

21. The Guides crossed the Panjkora river on the night of the 12th, and next morning advanced into the hills, but the bridge being broken and no supports able to cross, they were recalled, and during the retirement Colonel Battye (Commanding) was killed, and early next morning Captain Peebles, Devonshire Regiment, was mortally wounded. In addition, 2 officers, 3 British and 12 native soldiers, and 2 followers were wounded.

22. A bearer company was present at this action under Surgeon-Captain Birt, Army Medical Staff, while Surgeon-Lieutenant Sutherland, Indian Medical Service, was with the Guides.

Insanitary condition of camps, due to want of conservancy establishment.

23. Owing to this unexpected delay at Sado, consequent upon the bridge not being ready for the passage of troops, the camp, overcrowded with men and animals and being still without any transport conservancy establishment, became very insanitary, and the heavy rain on the night of the 14th converted the whole place into a muddy swamp. During the halt here a number of men were admitted into hospital with venereal, the result of a rigid inspection. There were also some admissions for ague and dysentery.

Occupation of Mundah, 17th April.

24. On the 17th the new suspension bridge being ready, the troops crossed in single file, the baggage following later on. In the early morning, however, the troops advanced to Mamujai, a distance of about six miles, and there found the enemy collecting and retiring from Gosam to the forts near Mian-Kelai. Though the troops were engaged here for some hours, nothing very much came of it, and no harm was done to either side.

Affair at Mamujai.

25. This affair at Mamujai was practically the end of regular or open hostilities, as on the arrival of the 2nd and 3rd Brigades at Mundah, before noon next day, it was discovered that Umrah Khan and his followers had betaken themselves to flight, and Mundah Fort was found unoccupied and the large village of Mian-Kelai on the other side of the river all but deserted.

Gatacre's flying column despatched to Chitral, 18th April. Composition of.

26. Within a few hours of our occupying Mundah on the 18th April, a flying column composed of—

The East Kent Regiment,
The 24th Gurkhas,
2 guns, Derajat Mountain Battery,

2 Maxim guns, and half a company of sappers and miners, started under the command of Brigadier-General W. F. Gatacre, C.B., for Chitral, crossing the Lowrai Pass, 10,000 feet high.

Sections of field hospitals.

27. This force was accompanied by a section each of No. 8, British Field Hospital, and No. 19, Native Field Hospital. The medical equipment of both these sections was altered, as far as possible, in the time available, with a view to making them as light and compact as possible compatible with efficiency.

The want of light detachable sections felt.

28. The field hospitals would be greatly improved if one section was equipped especially light, so that it could accompany small and rapidly moving bodies of troops, and so necessitate a minimum amount of transport.

Dir occupied by 3rd Brigade, 24th April.

29. This column was followed on the 20th April by the remainder of the 3rd Brigade which on reaching Dir halted there, and occupied it for some little time, and was in its turn followed by divisional head quarters.

Chitral reached by Gatacre's column, 16th May.

30. Chitral was reached and occupied on the 16th May by Brigadier-General Gatacre's flying column, and on this date the position of the brigade was as follows:—

Positions now held by brigades.

1st Brigade.—Still at Khar holding the Swat Valley.
2nd Brigade.—At Mundah holding the Jhandol Valley.
3rd Brigade.—Holding the Baraul Valley, and spread out between there and Chitral.

Commissariat advanced depôts.

The commissariat had advanced depôts at:—

1. Dargai.
2. Chakdara.
3. Mundah.
4. Dir.

Field medical store depôt.

31. The field medical store depôt was established at Khar, and remained there throughout the operations. Nothing could have been more satisfactory than the way the duties connected with same were carried out by Assistant Surgeon Shaw.

Medical stores at Mian Mir.

32. The medical stores were at Mian Mir, and the heavy and onerous duties there connected with the Chitral Relief Force, were most ably carried out by Surgeon-Major H C. Hudson, Indian Medical Service, who kept the field force well equipped with all the necessary drugs.

Sanitation of standing camps.

Chief sanitary want.

33. Now that fighting had ceased and that the troops were more or less settled down at the various posts, attempts were made to get the places into as good sanitary condition as circumstances would permit. The chief sanitary want at first felt was a good conservancy establishment for the posts, especially for the transport lines; also a sanitary, or coolie corps, who would remove and bury dead animals, take away, rake out, and burn litter, rubbish, &c. &c.

34. On my recommendation the General Officer Commanding was pleased to sanction 10 sweepers and a jemadar for large posts, and 6 sweepers and a jemadar for small ones, with a bildar for each (these numbers had eventually to be increased), but there was great delay in getting them owing, I understood, to the difficulty experienced in finding sufficient numbers of the sweeper class in any of the large stations in India.

Transport lines.

Disposal of litter.

Conservancy establishment improvised.

35. The great difficulty was of course with the transport lines, owing to the immense number of transport animals with the force (some 28,000 in all), and all of which had at first to be kept within the entrenchments at the various posts for safety. The mule drivers having much to attend to besides could not well be asked to do more than remove the litter in tarpaulins to certain established places for shooting same, and there endeavour to burn it. Their endeavours, however, were not quite successful, as unless each day's litter is carefully raked out so that it may dry quickly, it will not burn easily, and so accumulates. In wet weather the difficulty is, of course, increased. Meanwhile, until the conservancy sweepers asked for arrived, the best that could be done was to obtain sweepers from the field hospitals and corps units, when they could be spared, and set them to work at the most important points. The

services of the Kahars too were utilised to cut down and burn jungle and undergrowth.

Difficulties of sanitation in the field.

Disposal of dead animals.

36. After posts were got into fair sanitary order it was found very difficult to maintain them so, even after they had received their full conservancy establishment, owing to the number of "transport" animals perpetually passing through them to and from the front. The attendants with these animals—especially the hired camel drivers—were a hopeless class to deal with, and allowed their beasts to wander about grazing anywhere and everywhere during the time they were at each post, and it was found simply impossible to supervise such a multitude of densely ignorant people. The disposal of dead camels, especially at first, was a difficulty. Wood and kerosene oil, too, were not available.

Condition of camps.

Sites changed when possible.

37. The camps and entrenchments were maintained in as good sanitary condition as was possible throughout, bearing in mind the foregoing difficulties. As necessity arose and military necessities permitted, they were changed or shifted on the recommendations of the various senior medical officers.

The Sanitary Assistant and Provost Martial.

38. All these matters were well and ably seen to by Captain Shakespere, 6th Bengal Cavalry, with whom was associated Surgeon-Lieutenant E. Victor Hugo, I.M.S., who had been selected to look after the sanitary details.

Water supply for force.

Instructions issued regarding same.

Pakhals and mussacks.

39. As regards the water supply for the force, it was, with few exceptions, when it was necessarily taken from rivers, obtained from springs in the hillside, away from habitations and from all possible sources of contamination. Instructions were issued from the beginning to boil *all* drinking water *when possible* and to encourage the use of tea drinking both in camp and when on the march, and same were carried out when practicable; after a time, too, the addition of alum, or permanganate of potash, as germicides, was advised for water used for drinking purposes. The pakhals and mussacks were directed to be constantly seen to and periodically scoured inside, and small quantities of either alum or the permanganate were placed in both over night.

No illness attributed to water-supply.

40. In the weekly sanitary reports received from the various medical officers of the force, the quality of the water supply throughout was with one or two exceptions reported as most satisfactory, and there was never any reason whatever to attribute illness of any kind to its use.

Supply of drinking water for Bedfordshire Regiment at Laram.

41. In the case of the Bedfordshire Regiment, which suffered so severely from enteric fever while at the Laram Kotal, the water supply was, as far as could be ascertained, absolutely pure at the supply end, and was distributed by pakhals and mussacks carefully attended to, and treated as already described. This supply, too, was consumed by the officers of the Bedfordshire Regiment, amongst whom not a single case of the disease occurred, and also by all the officers occupying both the divisional and lines of communication head-quarter camps, as well as by two companies of the King's Royal Rifles quartered close by, and by sundry non-commissioned officers and men employed in and about these camps, and in the case of all without the least bad effect whatever.

The boiling of water in the field.

42. It is not always possible to boil water to any extent for drinking purposes under the conditions of field service. Fuel is sometimes if not often scarce; in rainy weather it is wet and will not burn, and even when it is dry and plentiful, and a certain amount of boiled water is in consequence obtainable, there are no means available, even if there was always time, to cool it in hot weather; when suffering from heat, fatigue, and thirst, men will drink the coolest water they can find, be it good, bad, or indifferent, in preference to the authorised supply; on the line of march the quantity of water in their water-bottles is necessary limited, and on long marches must be renewed from time to time from the nearest stream or spring.

The local milk supply.

Orders issued to boil it.

43. The local milk supply, always a source of danger, was especially so in the Chitral Relief Force. Nothing would induce the cow-owners to bring the cows from their villages to be milked in camp. They brought the milk instead and in the most filthy wooden bowls conceivable. The milk so brought was generally taken from different animals at different times, and on being boiled turned into whey. Many of course used it (contrary to orders) without having previously boiled it. Some officers commanding thought it

useless to forbid its purchase as men, who cared to, would obtain it surreptitiously. After a time many regiments sent zinc buckets to the villages for their supply and had it carefully boiled before issue. Even then this milk was of the very poorest quality.

Disposal of excreta. The trench system.

44. There was no difficulty regarding the disposal of excreta in the plains, trenches being established and attended to at proper distances everywhere, but in the hill stations it was impossible at first to carry out the "removal" system owing to the want of a sufficient number of sweepers, or of utensils. It was not desirable to have the trenches too near the men's tents, nor yet too far away, especially during dark nights in the rains, and yet some provision was necessary for men at night. After a time sweepers were obtained for the hill stations, and a "removal" system was improvised by means of empty tins and boxes.

Incinerators.

45. At the Laram Kotal incinerators were used most successfully, one in No. 1 British Field Hospital for excreta and rubbish, and one in the King's Royal Rifles lines for the latter.

Removal system and dry earth.

46. In both the King's Royal Rifles and Bedfordshire lines at Laram Kotal, the "removal" system with dry earth and disinfectants was most carefully carried out.

Bathing parades.

47. Bathing parades were instituted from the beginning, and had to be carefully regulated as regards hours and protection for the heads of the bathers.

Duties, fatigues, guards, &c.

48. As the duties throughout were very heavy, recommendations with a view to limiting the number of fatigues, picquets, guards, and other trying duties, as much as possible, were submitted.

Clothing and head-gear.

49. *Clothing.*—Strict attention was paid to this matter. At first the want of some protection for the temples and nape of the neck was felt, but in a little time the regiments got up a capital protector of quilted khaki material which went round the brim of the helmet and extended some way down the back, covering the nape well. The present soldier's helmet I consider quite unfit for field service such as was experienced on this expedition.

The Gurkha head-dress.

50. The Gurkhas suffered much from the heat in their little forage caps, and it is time some suitable protection for their heads from the direct rays of the sun was given them.

Khaki.

51. Khaki drill jackets, pantaloons and puttees were worn in the hot weather by the British troops, and serge (with great-coats when necessary) in the hills, or on night duty in the plains when the weather was cool.

Flannel belts.

52. The flannel belts of some regiments were unfortunately left behind at Nowshera when starting, and in the case of Highland Regiments was a serious matter, as when the men of same took off their kilts at night they had no "putties" to replace the flannel belts with.

Number of flannel shirts per man.

53. Most men had only two shirts with them, one for present use and one to go to the washerman, and the question of issuing a third on an expedition such as this is well worthy of consideration.

Field rations.

54. The rations were on the whole, as field rations go, good, especially at the beginning, but I am quite satisfied that, considering the hardships and exposure which British soldiers undergo on field service, especially on the frontier, they must be much better fed than they are at present: the entire scale of their dietary in the field wants careful revision, as regards both quantity and quality.

Fresh meat.

55. *Meat.*—The fresh meat was always very lean and generally poor in quality and tough, so much so that many men after a time gave up eating it. It was also often, in my opinion, a cause of intestinal irritation.

Bread.

56. *Bread.*—This was generally good, often very good; towards the end, however, some atta under the name of "breadstuff" was substituted for flour, and then the bread did not bake properly, and was spongy and doughy. This substitution of coarse unsifted atta for fine flour should never be permitted.

Tinned meat.

57. The tinned meat occasionally issued was good of its kind.

Vegetables, fresh (compressed). Preserved potatoes.

58. *Vegetables.*—After the first two months no fresh potatoes fit to eat could be obtained; preserved potatoes were accordingly issued instead, but were not much appreciated, especially if they had lain in store for a time before being served out. The "compressed mixed vegetables" were universally condemned. Unless soaked for 12 hours before being cooked, they were scarcely eatable, or, if partaken of, were most likely a cause of diarrhœa.

A good compressed [preserved ?] vegetable is a desideratum. Fresh onions were fortunately very plentiful, and were largely partaken of by everybody.

Antiscorbutics.
Lime-juice.

59. Lime-juice was issued bi-weekly to the British troops and occasionally in special cases to native troops, and was much relished by all.

Kokum.

60. *Kokum.*—A trial was made of kokum for native troops and followers, but with the exception of Madrassis and some men from Poona, who were accustomed to it, nothing would induce them to use it, as they said it disagreed with them in various ways. The fresh "kuronda" fruit has a tough skin and in the dried kokum it powders, is insoluble, and most astringent. The quantity required for real antiscorbutic effect would most probably soon injure the bowel.

Amchur.

61. *Amchur*, on the other hand, is greatly liked by all natives; it is a well proved antiscorbutic agent, and instead of being astringent the large amount of ligneous tissue it contains acts as a mild laxative.

Coffeeshops.

Should be abolished.

All supplies should be issued by commissariat.

62. Most, if not all, British corps units had a coffeeshop of some kind, owned and managed by natives attached to them. These shops are semi-recognised institutions in the field. I consider they should be abolished as the food sold by them is often of doubtful, if not dangerous quality, and is sold at exorbitant prices. Some of them, too, are kept in a filthy condition, and if not closely supervised at all times may originate disease. They should be abolished and the Commissariat Department should sell or issue similar articles, though of the very best quality, and at reasonable rates even at a loss.

Armebis.

63. The emergency ration, known as "armebis," was not a success, and was eventually condemned as not being safe. A great number of tins of same went bad, and one man of the East Kent Regiment was seized with symptoms of ptomaine poisoning after eating the contents of one and very nearly died. Even when good, these biscuits were a possible cause of diarrhœa, owing probably to the imperfect milling of the envelope of their wheaten constituent.

Alcoholic stimulants.

64. The issue of alcoholic stimulants, except when recommended on medical grounds, was prohibited during the operations.

Cooking.
Cooking utensils.

65. The cooking throughout was satisfactory, but no cooking vessels containing copper should be allowed in the field, steel ones being supplied instead.

Health of the troops at the beginning of hot weather.

Of 1st Brigade.

66. The general health of the troops composing the force as gauged by the number of admissions to hospital was up to this very good; men, however, were now beginning to feel the heat, especially in the Swat Valley; and to suffer from ague, diarrhœa, and dysentery, due to a great extent to chills consequent upon alternations of temperature. This was especially so with the British troops comprising the 1st Brigade at Khar, where the heat during the day in single-fly tents was much felt. These men, too, had come from Peshawar, where the King's Royal Rifles had suffered a good deal from fever.

Enteric fever.
In the 1st Brigade.

67. A case of enteric fever occurred at Khar in the person of a man of the Bedfordshire Regiment on the 29th April. The disease later on became epidemic in this regiment in the hills, and caused no less than 128 admissions and 28 deaths. The cause and history of this epidemic will be dealt with later on under "Medical Transactions." In the case of the 2nd Brigade the general health of the men had been extremely good up to their arrival at Mundah (18th April); as soon, however, as they settled down into inactivity, diarrhœa and dysentery at first of a mild type made their appearance. Later on the cases of the latter disease assumed a more severe form, and five cases contracted at Mundah proved fatal in the hills, after their removal there with the field hospital.

In the 2nd Brigade.

68. Before leaving Mundah this brigade was unfortunate enough to contract enteric fever, too, and during its stay in the country 5 officers and 53 men were attacked. Of the former none died, of the latter 21. (*Vide* Medical Transactions.)

In the 3rd Brigade.

69. The 3rd Brigade kept very healthy, too, though as in the case of the other brigades it furnished its quota of admissions for ague, diarrhœa, and dysentery.

Health of the "flying column."

70. Regarding the health of the "flying column" under Brigadier-General Gatacre, the Medical Officer of British troops, Surgeon-Captain C. W. Reilly, writes as follows:—"There was practically no sickness amongst

"the British troops until they crossed the Lowari Pass and halted at Ashreth. At the latter place, however, diarrhœa of a dysenteric type became "very common and affected all ranks, officers and men."

Selection of sites for British troops in the hills recommended.

Delay in moving troops up.

71. Up to the end of April ordinary and suitable cases of sickness were sent back to the base by convoys, but after that, it not being considered advisable or even safe to do so, owing to the intense and exhausting heat along the line, the necessity for finding sites for British troops and hospitals in the neighbouring hills, especially for those in the Swat Valley, was impressed upon the authorities. Though positions were soon after found, still some delay in sending the troops up—due no doubt to military necessities—occurred, but by the middle of June all the British troops, except detachments at Kila Drosh, Ashreth, Surbat and Bandai, were in the hills, and with them the British Field Hospitals of divisional troops, minus some sections of same for the detachments alluded to.

The lines of communication, extent of.

72. Though it is generally understood that the lines of communication of a force extend from the base of same to a given point in rear of—though in touch with the advancing field force—nevertheless this was not so in the Chitral Relief Force after the 8th of May, when a divisional order appeared extending the lines of communication to Dir inclusive. From this date, therefore, the great bulk of the force and practically all the divisional field hospitals were under the command of the General Officer Commanding Lines of Communication. In other words, after that date a line drawn horizontally across the force at Dir separated the divisional from the lines of communication troops, whereas to divide the former from the latter field hospitals, a perpendicular line from Dir to the Malakand (both included) would be required. In this way the medical officers of divisional and brigade field hospitals had two Principal Medical Officers, and the Principal Medical Officer, "Chitral "Relief Force," was in a way serving under two General Officers Commanding, viz., the Lieutenant-General Commanding and the General Officer Commanding Lines of Communication.

Formation of 4th Brigade.

73. About this time the 4th Brigade was formed under the command of Brigadier-General Hammond, V.C., with its head-quarters at the Malakand. The lines of communication hospital at this latter post (No. 24 Native Field Hospital, Surgeon-Lieutenant-Colonel Murphy, D.S.O.) thenceforth performed both duties, viz., the care of the divisional troops, as well as the lines of communication sick convoy work. Sections A and B, No. 4 British Field Hospital and No. 17 Native Field Hospital, were likewise handed over to the Principal Medical Officer, Lines of Communication; Sections C and D of the former and No. 24 Native Field Hospital being made divisional field hospitals in their stead.

Collateral charges.

74. As the head-quarter staff of a field force is frequently detached and independently on the move in the field, and so unable to obtain speedy medical assistance if required, a medical officer (with necessary equipment should be appointed to its sole charge, and this course had ultimately to be adopted with the head-quarters.

75. Mountain batteries, Royal Artillery, should be similarly dealt with, in in fact, each and every corps should have its own medical officer.

Anticipated early return of the force.

76. About the middle of June immediate orders for the early return of the force to India being expected, everything connected with the transport and comfort of the sick, who in this case would have had to move back with the troops, was seen to.

Difficulties experienced in obtaining medical comforts.

77. Having previously found that difficulties were experienced by medical officers in charge of sections of field hospitals at Ziarat and Mirga in obtaining medical comforts for the sick, and knowing that the stock of same in the field was now exhausted or nearly so, the reserves not having been maintained, a strong representation on the subject was made to the Lieutenant-General Commanding, as if fighting was renewed on the return march, the local supplies would have stopped, and the sick would have been reduced to great straits.

Force ordered to remain.

Fresh supplies of medicines for field hospitals indented for.

78. As it turned out, however, the orders when they did arrive were to the effect that the force was to remain in the field till the autumn, and so fighting, so far, was not resumed, and the local supplies continued to be received as usual. Indents for a further three months' supply of medicines for all the

field hospitals of the force were now prepared and sent in, and the drugs soon after received.

Quinine issued prophylactically.

79. On the 29th July quinine was issued prophylactically to the whole force, followers included.

Evacuation of the Baraul and Jhandol Valleys.

Panjkora Valley route opened.

80. On the 13th and 14th August the Baraul and Jhandol Valleys were peacefully evacuated, and the troops from them transferred to east of the Panjkora, Chutiatan (at the junction of the Baraul and Panjkora Valleys) alone being held. This (the Panjkora Valley) route starting from Sado passed through Namsir, Warai, Gundegah, and Chutiatan to Dir.

Bedfordshire Regiment sent back to India.

81. On the 14th of this month the Bedfordshire Regiment was sent back to India, all efforts to stamp out enteric fever amongst its ranks having failed.

4th Brigade broken up.

82. On the 15th August the 4th Brigade was broken up and then ceased to exist.

East Lancashire Regiment sent to India.

83. The East Lancashire Regiment left the Malakand on the 18th instant for India, and soon after a force suitable to hold Chitral, the Malakand, and Swat Valley was detailed, including the necessary field hospitals.

Demobilization of field hospitals begun.

84. On the 22nd August the demobilization of the field hospitals began.

East Kent Regiment sent to India.

85. On the 4th of September the East Kent Regiment arrived at the Loram Kotal from Dir, and soon after commenced to send in cases which eventually turned out to be enteric fever, and which was clearly contracted on the march. As the disease showed no signs of abating, but rather the contrary, the regiment was promptly despatched to India, leaving Laram Kotal on the 14th of this month.

Demobilization of divisional head-quarters.

86. The demobilization of divisional head-quarters took place on 28th September at Nowshera.

Return march of the force.

87. On the 20th of September all the troops, except those ordered specially to remain in occupation, accompanied by their attached field hospitals, commenced the return march, and by the 3rd October all had left Nowshera for their respective stations in India.

Demobilization of field hospitals at Nowshera.

88. As the various field hospitals arrived at Nowshera they demobilized, and in the process not a single hitch of any kind occurred.

Damages and losses in same, responsibility for.

89. As there is some question as to responsibility for damage and losses of field hospital stores after they are handed over to the commissariat at the base and before they are examined at the equipping stations, it would be well if arrangements could be made to take over all such stores finally at the base, or that the medical officer in charge should proceed with his hospital to the equipping station.

Criticism of existing field hospital arrangements. Mobilization.

90. *Field Hospitals, Mobilization of.*—Orders to mobilize field hospitals having been received at most of the equipping stations about the 18th March, those detailed for divisional and lines of communication troops arrived at Nowshera between the 27th and 31st March. Those intended for "sick and "wounded returning from the front" reached the latter between the 7th and 10th April.

On the whole satisfactory; deficiencies noted in.

91. With the exception of Nos. 2 and 8 British Field Hospitals, and Nos. 14, 18 (Sections C. and D.) and 35 Native, all these field hospitals were well and fully equipped, and ready for work at the appointed time. Those named were chiefly deficient in ambulance transport, thus:—

Hospital in which equipment deficient.

No. 2 British Field Hospital, equipped at Rawal Pindi, was minus 20 dandies and 80 saddles for riding mules. No. 8 British Field Hospital, equipped at Umballa, was deficient of 10 dandies and 25 Kahars, also of 157 pack mules and chaguls for same. No. 14 Native Field Hospital, equipped at Peshawar, was unable to obtain any of its ambulance transport before starting. No. 18 Native Field Hospital (Sections C. and D.), equipped at Rawal Pindi, was minus 10 dandies at starting. No. 35 Native Field Hospital had to leave Rawal Pindi minus 16 dandies and saddles for 80 riding mules, pack-saddles being supplied instead. It was likewise deficient of a considerable portion of clothing for its followers.

Equipping stations affected.

92. The equipping stations which turned out their field hospitals satisfactory were Bareilly, Agra, Allahabad, Meerut, and Lucknow.

Those failing to do so were Peshawar, Umballa, and Rawal Pindi. Applications at these latter stations failed to procure the deficient equipment, and some of the hospitals were actually in the field before they obtained same.

93. At Rawal Pindi the Chief Commissariat Officer stated that the equipment wanted would be found at Nowshera, none, however, was available there, and No. 2 British and 35 Native Field Hospitals only made good their deficiencies on the eve of the Malakand fight, by taking over some from No. 24 Native Field Hospital. It has always been understood by the Medical Department that the whole of the material for ambulance transport should be found stored at the field hospital equipping stations, so that no unnecessary delay should occur on orders issuing for mobilization. Such, however, proved not to be the case at the stations named, and it is doubtful if its presence can ever be counted upon, unless it is so placed, and likewise periodically examined as are the medical and commissariat stores at these places.

Medical transport officer desirable.

94. A trained medical transport officer at the base during the mobilisation period would ensure the ambulance transport of a field force being correct in every detail.

Other difficulties experienced in mobilizing field hospitals.

95. The other difficulties experienced in mobilizing the various field hospitals of the Chitral Relief Force were chiefly due to—

(a) the delay in arrival of personnel owing to the present system of scattered mobilization; and

(b) to the inexperience and want of training in such matters on the part of a large proportion of the personnel and establishment.

Duties of medical officer in charge very onerous.

Personnel and establishment.

Owing to the foregoing the work of mobilization falls heavily, and chiefly at a time of great pressure, too, on the medical officer in charge, the only one probably who has had any previous experience of field service. Hardly any one else knows how to make up or tie on loads on animals, to pitch a camp, or, in fact, anything about the thousand and one details which go to make up efficiency on such an occasion. The personnel and establishment, who should know each other and be accustomed to work together, are to a great extent merely coolies picked up in the bazaar at the last moment.

Transport sergeants.

96. The transport sergeants, too, from inexperience, are useless for a considerable period, and especially at first when their services are most required.

Kahars.

97. *Kahars.*—These were for the most part untrained and of poor physique, and of the "Chamar" class. Those employed on level ground on the lines of communication did well enough. Thus six of them carried sick from Serai to Chakdara, 12 miles, in all weathers, and returned the same day. In the hilly regions, partly owing to their poor physique and partly to the weight of the dandies, it took eight of them (occasionally 12, and even more) to carry a European soldier, and they even then got into camp late. Surgeon-Captain Reilly, however, speaks very well of those who went up with his section hospital to Chitral, and of their powers of endurance, but apparently he was exceptionally lucky in his men. The Sirdars and Mates throughout being "Chamars," had little or no influence over the bearers; had they been selected men of the true "Kahar" class it would have been otherwise, and they would have had no difficulty in exacting obedience from their men.

Animal transport.

Ponies and mules.

98. *Ponies and Mules.*—As transport for sick, riding mules were given to some hospitals, ponies to others; of the latter all were unbroken, and as many as 20, 30, and even 40 stallions were given to field hospitals. No. 5 British Field Hospital, on arrival at Nowshera, had its mules taken away and ponies given instead, 75 per cent. of which were stallions. The latter gave great trouble, and could not be ridden or managed even by men in health. Though some few medical officers prefer ponies for this work, the vast majority are decidedly in favour of mules, and there can be no doubt but that, everything considered, they are *the* animals for same. If, however, ponies must be used, only mares or geldings should be employed.

Scale of drivers allowed.

99. One driver to three animals is laid down for baggage transport; but though there is no reference to the matter in the "equipment tables" and the same number are tendered for ambulance transport, still one driver to every two animals is *absolutely necessary* for the latter work; more, however, would be an encumbrance.

Dandies; the fitness of the dandie.

100. *Dandies.*—In this campaign the unfitness and general unsuitability of the present dandie for the transport of sick and wounded, where the latter had to be carried over rough and hilly ground, has been proved up to the hilt. The dandies, too, are unportable, and cannot be folded up or placed on mules. If they must be retained the covering should be altered so as to afford far

Modified stretcher required for mountain warfare.

more protection from the sun, and should be of khaki colour. What is evidently wanted for mountain warfare is a stretcher of some kind, or, as suggested by Surgeon-Major Money-Shewan, some modification of the French "Goutiere de Bonnet."

Tindals and Lascars.

101. The Tindals and Lascars supplied knew absolutely nothing of the work they were engaged for, and same was done by the Kahars.

Carpenters.

102. The carpenters, highly paid as they were (Rs. 22·8 per mensem), were in many cases unacquainted with the use of the tools they carried, and were very often only ignorant coolies.

Where other hospital servants are to be obtained from.

103. Though the Field Service Departmental Code, Medical, states that Tindals and Lascars are to be obtained from the Commissariat Department, it makes no mention of where temporary cooks, water-carriers, and sweepers are to be got from.

104. All the hospital servants supplied by the Commissariat Department were a very poor lot.

Equipment of field hospitals.

Medical field panniers and contents.

105. *Medical Field Panniers and Boxes.*—Those at present in use are far too large and cumbrous, and are not adapted for mountain service transport. For mule transport on a hill path with sharp turnings, they should be shaped differently, and the saddle fittings altered. If slung on the sides of the pack-saddle they should be of the make and the dimensions of those used by the Sappers and Miners; but I see no reason why they should not be carried on top of the pack-saddle, as are the guns of the mountain batteries. The width of a field hospital mule, equipped as at present, is a great difficulty on a narrow track winding between projecting rocks. The present large metal cornered boxes are the terror of passers-by, and they also catch the mule in the shoulder when he turns sharply.

Medicines in tabloid form suggested.

106. By substituting medicines in tabloid form for those now in bulk, and by getting rid of many of the large, heavy, and useless surgical appliances and other articles contained in these boxes, both the latter and the panniers might be made considerably smaller and placed either on the top or at the sides of the pack-saddles as desired.

Drugs.

107. *Drugs.*—Very many of those supplied are medicines which would be rarely if ever used on field service, while many that were in constant demand were unobtainable. The quantities, too, of some supplied were much too small, that of castor oil absurdly so. On field service an immense quantity of the latter is required, and should be a separate and special supply. All drugs that can be prepared in tabloid form should be so supplied, not only to lessen weight, but also to save loss by breakages.

Unsuitability of glass bottles.

108. The antiseptic solution, instead of being prepared in the field from tabloids, is carried in eight large bottles, weighing exactly 16 lbs. Five out of the eight of these in B. Section, No. 19 Native Field Hospital, got broken between Mundah and Chitral. The medical officer in charge of the latter writes: "The breakage of bottles in my section was enormous, and the only "wonder is that the boxes themselves were not smashed to pieces from the "hammering they got from projecting rocks along the side of the road."

Marking of hospital boxes.

109. All Hospital boxes and packages should have the number of the package of the hospital, and of the section, at each end of same, thus:—

3 British (or Native).

$\frac{C}{3}$

and each hospital should have a distinguishing colour recognisable by natives; a supply of paint is also desirable.

109A. *Pakhals.*—Some spare pakhals for each section should be carried in the kahjawas.

Rope.

110. *Rope.*—A liberal supply of rope, too, should be allowed each hospital, or section of same.

Kadjawahs.

111. *Kadjawahs* of a new and improved pattern are not only desirable but necessary.

Blankets.

112. *Blankets.*—The number supplied is greatly in excess, and might be reduced by 200 (weighing about 12 maunds): each sick man brings in at least one blanket with him, and the commissariat should have some spare ones in their depôts if required.

Tents, material of.

113. The 80 lbs. single fly tents are absolute sieves and are very little protection against really heavy rain, which drives right through them. The material of which they are composed might be made more or less waterproof by being coated with some solution like alum and sugar of lead. Their number, too, should be raised from 10 to 12 per hospital so as to give three per section, thus:—

Number required.

One for an office.
One for rations and havildar or ward orderlies, and
One for hospital assistants.

40 lb. tents.

114. The 40 lb. tents proved most unsatisfactory for their occupants (the transport sergeants) in hot weather. They should be of lighter material and much better ventilated.

Double-fly mountain service tents.

115. The double-fly mountain service tents were very serviceable, but they would be much improved if the outer fly was continued at the ends pretty low down, so as to form a porch to prevent sun or rain getting through the inner fly.

Necessary tents.

116. *Necessary Tents.*—Should be supplied for medical officers and medical warrant officers, who at present have to use the same screen and trench as followers.

Marking of tents.

117. All tents should be marked on both inner and outer flys with the number of the hospital and section of same; all too should be supplied with spare ridge and standing poles (of male bamboo), as breakage of same often occurs during storms: the extra weight of these poles could be more than counterbalanced by reducing the number of blankets.

Tarpaulins.

118. *Tarpaulins.*—Those supplied were coarse and heavy and of the worst description. They were daubed over with tar before issue to hide their defects. Even when new they are very heavy and almost impossible to fold up. In their stead the waterproof Willesden canvas which is also light and durable should be supplied.

Lanterns.

119. *Lanterns.*—Most medical officers took the precaution of leaving the old green ones behind at Nowshera. Those who neglected to do so regretted the fact before they had got far.

Orr's lamps.

120. The Orr's lanterns supplied are too heavy and were found useless for bedside work in hospital at night. The smaller Orr's (as supplied to Public Works Department) in tin cases would answer just as well, and are only a third of the weight; but what is really wanted is a good candle lantern made of the very best tin, some 4½ to 5 inches square and about 10 inches high; three of its sides should be of glass, the fourth of some white bright metal to serve as a reflector. It should have two handles, one to hold if required at the bedside as a bull's-eye lantern, the other by which it could be suspended. Six per section should be allowed, and all should fit into a box, each in its own compartment. In this same box should be carried spare glasses for sides. The latter if protected by wire rarely break.

Storm-lantern required.

121. Some good bull's-eye or storm lanterns are also needed for use in bad weather.

Red lamps.

122. The red lamps for night might be reduced to one-half, *viz.*, to one per section.

Directing flags.

123. *Directing Flags.*—The two large flags and poles are not needed for each section, though they might be useful in a close country intersected by roads.

124. *Trenching tools.*—Two "mamooties" or large hoes, are allowed to each section, but are not in themselves sufficient for trenching purposes. There should be two picks, two mamooties, and two koolharis (small hatchets) per section. The picks are most needful to loosen the soil when trenches have

to be made in stony ground, and the koolharis are necessary for cutting wood; often the latter is ordered to be cut by corps from the hillside, or is supplied by the commissariat in large blocks which require cutting. Or, instead of the picks and mamooties being separate, the two might be replaced by a combination of both.

Mallets.

125. *Mallets.*—The four large mallets might be dispensed with. The "general service" ones are quite enough for ordinary occasions.

Tables.

126. *Tables.*—Those supplied were excellent.

Operating tables.

127. *Operating Tables.*—These stand practically condemned. A new pattern one was sent to the force for trial and report by the Principal Medical Officer, Her Majesty's Forces in India. It was found not only an immense improvement on the present one, but one which with one or two slight alterations would answer the purpose for which it was intended.

128. There was, however, a consensus of opinion amongst medical officers of the force that operating tables in field hospitals are unnecessary, as two office tables, or the boxes with blankets placed over them, answer admirably in emergency.

Chairs and stools.

129. *Chairs and Stools.*—All supplied were flimsy and useless, and many of both got smashed after a few marches.

Padlocks.

130. *Padlocks.*—Two special padlocks should be issued with each section for boxes in which to place pay, confidential papers, &c.

Commodes.

131. *Commodes.*—The pans in these should neither be of tin nor of copper, but of enamelled iron and should be nested.

Tin pans for night latrines on the march.

132. A nest of tin pans, however, say, six per section, should be supplied separately for night latrines on the march. In standing camps empty kerosine or ghee tins are always available.

Lines of communication, hospitals "British."

Should not be used as rest-houses.

133. *Lines of Communication.*—The hospitals on the lines of communications were as previously detailed and received all sick, &c., passing down from the front. They were also by permission of the lines of communication authorities used as "rest-houses" for parties of healthy troops, a course that should not have been permitted and of which I cannot too strongly disapprove.

Personnel of.

134. *Personnel, Medical Officers.*—On the assembling of force at Nowshera much inconvenience and loss of time was experienced owing to the want of any detail of medical officers appointed to the various field hospitals of same. This information should have been supplied to the Principal Medical Officer of the force at the very beginning of the operations.

Medical officers for pioneer regiments.

135. A medical officer should be appointed to each wing of a pioneer regiment, which are always apart in the field.

Paragraph 200, Field Service Departmental Code, Medical. (1892).

136. The regulation, by which casualties in the medical *personnel* of corps and field hospitals in the front will be replaced from hospitals on the lines of communication, would, if acted upon, throw all the medical arrangements and possibly every hospital of the force into confusion. Casualties should be replaced from the base in every instance.

Native field hospitals on lines of communication. Hospital assistants for.

137. *Native Field Hospitals, Hospital Assistants.*—As hospitals are almost certain to be broken up in the field, 8 hospital assistants should be appointed to each native hospital, and of these 8, 4 should be able to keep clear records in English.

Ward orderlies. Their dress and equipment.

Necessity for their being armed.

Distinctive dress for.

138. *Ward Orderlies.*—These men should be more carefully chosen. They should have physique as well as intelligence. Their armament should be of one pattern, with bandolier equipment, and a Martini carbine with 20 rounds of ammunition would probably be the best they could be given, and not, as at present, that of the regiment from which they come. It is well to have these men armed, as native hospitals are unable to obtain regular guards, when it is something to have six rifles available for defence. Ward orderlies, too, should be all dressed alike in uniform. The coat should be the Norfolk blouse with four good pockets, and the pyjamas or knickerbockers should be loose with puttees.

Hospital writers.

139. *Hospital Writers.*—An allowance of Rs. 30 per mensem is sanctioned for this purpose, but as it is usually impossible to procure the services of a professional writer the clerical duties have to be carried out by the medical warrant officer or hospital assistants (whose time and energies are already overtaxed) in addition to their own legitimate work. This matter wants urgently seeing to.

Army Hospital Corps, weapon for.

140. *Army Hospital Corps.*—These men should be armed too on service; something like a khukri should be given which would be useful for cutting wood, &c., as well as to defend themselves with.

Transport animals. Responsibility for care of.

141. *Transport Animals.*—These animals, when told off to field hospitals, were placed regularly under charge of the medical officers of same, who were consequently responsible for their care and condition, and everything went well for a time. Later on, however, orders were issued authorising officers, non-commissioned officers and men, and in fact anyone and everyone passing up and down the line on duty, to demand ponies from field hospitals to take them on stage by stage. These orders were freely availed of, and with the result that many of the ponies were overworked, badly fed, and generally neglected. Instead of taking them on one stage at a time, the borrowers often took them two, and were not careful to see them either groomed or fed while they had them, or even returned when they had finished with them; it was often with difficulty and after much correspondence that medical officers were able to ascertain their whereabouts and get them back. Notwithstanding all that can be said in its favour—and I am aware that much could be—it is, nevertheless, a bad system, and if medical officers could but be sure—which they are very far from being at present—that they could always get good and suitable animals as they required them, they would much prefer that the latter were placed in the sole charge of the transport officers.

Riding gear of transport animals. Saddles.

142. *Riding Gear.*—The present saddles are objectionable in every way for sick, or even for men in health, being too high off the animal, too short, and having a ridge as it were between the pommel and the cantle; riders were thrown too far forward on the neck of the animal, and were at the same time rubbed on the sacrum by the cantle. The knee flaps should be either placed further forward or removed altogether. Four out of the 20 saddles supplied should be of the hunting pattern for small and thin ponies, with strong frames for the rough work required from them. All saddles, too, should have two pairs of slings.

Extra slings for saddles.

Kahars on lines of communication, under whose disposal?

143. *Kahars.*—As previously stated, the bearers on the lines of communication did well on level ground. Though much may be said, too, in favour of the system of placing these men at the disposal of officers commanding posts, commissariat officers in charge of advanced depôts or godowns, and of others, when not actually employed at their legitimate work, much also may be said against it. The services of these Kahars were certainly utilised to the fullest extent possible during the operations in cleaning camps, building "chuppers" and huts, carrying wood and wire for the construction of bridges, cutting and bringing in grass, loading and unloading in commissariat godowns, &c., &c., and in these and many other ways well earned the even high wages they got.

Duties Kahars were called upon to perform.

Reserve of Kahars.

144. Considerable inconvenience was caused at the beginning by its not being known that reserves of Kahars were maintained, one (of 300) at Rawal Pindi, the others at the different commissariat depôts along the line.

Hospital necessaries.

145. *Hospital Necessaries.*—Some of these, such as sheeting for bandages, pakhals, &c., instead of being brought up from the base were purchased locally, and being of inferior quality were returned to the commissariat.

Stationery, books, returns, forms, &c.

146. *Stationery, Books, Returns, Forms.*—The following books should be supplied to each field hospital or detached section of same:—

Nomenclature of diseases, Field Service Manual and Equipment Tables. The two latter should likewise be furnished to station hospitals in India.

147. Few medical officers, when orders to mobilize are issued, know what stores, &c. they are entitled to receive from the various departments of supply.

Medical history sheets in the field.

148. *Medical History Sheets* are useless, and liable to loss or injury in the field; they should be retained with the depôt of corps left behind in India, and filled in and kept up from medical certificates sent there on the man's discharge from hospital.

Medical certificate forms.

149. *The Medical Certificate Forms* should possess a column for religion.

Stationery box.

150. *The Stationery Box* should be more carefully examined at the half-yearly inspection, all obsolete "Forms" removed, and those now required on field service supplied in their stead.

151. Some requisitions on the medical store department should also be supplied.

Paragraph 128A, Field Service Departmental Code, Medical.

152. It is laid down in paragraph 128A., Field Service Departmental Code (Medical), that in military accounts, Form 72, when used as returning lists of the medical and surgical stores of field hospitals on demobilization, the details should be printed. This is not done, and consequently a vast amount of very useless labour is thrown on medical officers in charge of these hospitals. Army Form, No. 64, for commissariat stores is so printed, and is a most excellent form.

Number of sanitary reports for troops.

153. With a view to lessen correspondence and clerical labour, one sanitary report furnished by the Senior Medical Officer of same should suffice for each post or stage.

Paragraph 109, Field Service Departmental Code, Medical.

154. It would be well if British officers of native corps were treated statistically as well as medically by the British field hospitals into which they are admitted. Great confusion is caused by the present system, especially when these officers are transferred from one to many hospitals on being sent back to the base.

Sick convoy work.

155. *The sick convoy work* throughout was carried on, often under great difficulties, in the most satisfactory way. During a short period of intense and exceptional heat it ceased temporarily for British troops, but was resumed when the rains were well on and the weather cooler. Soon after its temporary stoppage the British troops commenced to move to the hills, where the sick of same were likewise sent up for care and treatment. On the resumption of the convoy work European private tents, medical comforts, ice, mineral waters, and hand punkahs were liberally supplied at all the stages along the line. This convoy work was carried out as follows:—

How carried out.

On permission being obtained by medical officers in charge of posts or hospitals from the Principal Medical Officer, Lines of Communication, to forward sick to the base, the names of the latter were entered on a "way bill" in the Principal Medical Officer's office. The sick then started, as arranged by wire, on a given date, and proceeded stage by stage, picking up others as they passed along towards the base. The parties of sick were divided, as far as possible, into British troops, native troops, and followers, under the care of an assistant surgeon and a non-commissioned officer of a British regiment, or of an hospital assistant and havildar, according to nationality, and were limited at first to 25. Later on, when the pressure became greater, as many as 50 were sent down at a time. Between July and September, it being considered unsafe for convoys to proceed at night through the Baraul, Jandhol, or Talash Valleys, the sick were obliged to start at dawn so as to be in at the next "post" by 8 a.m. Those fit to resume the journey the same day left again about 4 p.m. so as to arrive at the succeeding stage before dark. With the exception of the long stretches between Nowshera and Dargai, which were after a time somewhat broken by the formation of a rest-camp at Rushakai, half way between Hoti Mardan and Nowshera, the stages between the latter station and Dir were short and easy in view of the comfort of the sick, and averaged about 8 miles. When the Baraul and Jhandol Valleys were evacuated, the sick were passed down through the new Panjkora Valley route, whence they proceeded *viâ* Chakdara to Nowshera. On arrival at Nowshera, where rest-camp hospitals had been formed for both British and native troops, those fit to proceed were railed to Peshawar for admission to the general hospitals there established, suitable cases being afterwards passed on to Cherat.

Paragraph 114, Field Service Departmental Code, Medical.

156. Carriage of the kits of sick cannot be carried out. When spare mules were not available in the various field hospitals for this purpose they had to be obtained from the transport department.

Ammunition of sick.

157. *Ammunition of the Sick.*—Some of the latter took back to the base as much as 70 rounds per man with them.

Sanitation of posts on lines of communication.

158. The sanitation of posts was carefully looked after by the medical officers in charge, and they were frequently inspected by the lines of communication authorities.

Sanitary condition of Nowshera at end of March.

159. On the departure of the troops hitherto garrisoning Nowshera for Peshawar, about the middle of March, all the conservancy sweepers were removed at the same time, and no adequate provision was made for proper conservancy arrangements in view of the immense number of troops, followers, and transport animals then about to arrive in Nowshera. The result was that

the station got rapidly into a very insanitary state, and had to remain so for some time after the force advanced.

Trench system on lines of communication.

160. The trench system of latrines was adopted all along the lines of communication, and with care answered well.

Incinerators.

161. Incinerators were used for burning the carcasses of dead animals, litter, rubbish, &c.

The water supply.

162. The water supply was carefully looked after and protected from pollution; alum or permanganate of potash was placed in the various receiving vessels in small quantities before distribution. Whenever possible that used for drinking purposes was boiled before use.

Medical comforts for the force. Condensed milk. Reserve of same not maintained. Great necessity for an unlimited supply of.

163. *Medical Comforts. Condensed Milk.*—The quantity supplied to each field hospital, viz., 52 lbs., is ridiculously insufficient; it should be at least double the amount. The reserve amount of same, too, laid down in Field Service Departmental Code (Commissariat) is also absurdly small. If there should happen to be much sickness at the beginning of operations with an absence of any local milk supply, the sick would simply have to go without the one article of nourishment they most require, and can best take and assimilate, till a further supply of tinned milk was brought up from the base. Each tin of condensed milk is supposed to make 5 pints of milk, but in practice it is found that 4 pints is as much as can be got from one tin. Some medical officers allowed only 3 pints from each tin. Care should be taken that only the very best brand should be supplied (unsweetened for British, and sweetened for native field hospitals), and in square tins if possible.

Medical comforts for native field hospitals.

164. For native field hospitals port wine and barley are not required. Rum might be substituted for brandy too. The amount of tea and sago might be very much reduced, as these articles—on the lines of communication certainly—are always easily obtainable from commissariat depôts.

Expense box.

165. It would be advisable to have some tea, sugar, condensed milk, arrowroot, and sago packed in one and the same "expense" box to avoid having to open several boxes to get at these various articles.

Health of the native troops of the force.

166. The health of the native troops, bearing in mind the amount and variety of the duties—often of an exhausting nature—performed by them was, on the whole, good, and the powers of endurance manifested by them throughout the operations somewhat marvellous. While performing the most arduous duties in all weathers and under all circumstances they were always both willing and cheerful. No complaints have reached me regarding their food, shelter, or clothing. The padded coats worn by the 25th Punjab Infantry while on duty at Gujar when the weather turned cold must have saved much sickness, and they should be in possession of all native corps serving in the Punjab.

Followers.

167. *Followers.*—The physique of the followers as a body, and especially of the hired transport followers, was very poor. The latter, in addition, were terribly overworked, being on duty for weeks together without rest or food from 5 a.m. till 8.30 p.m., and even then had to cook and eat their evening meal before turning in for the night. In one month at Dandai, out of a strength of about 350, two jemadars, three duffadars, and 21 drivers had to be sent to the base, to say nothing of the numbers then remaining in hospital, or who had died, or been previously invalided from that post. All followers should be carefully inspected before being passed medically fit, and when taken on should be well fed and clothed (in uniform of some kind) and not overworked. To treat them otherwise is very false economy.

168. No provision was made for supplying pure drinking water to these men at "posts" where the supply was a long way distant, the result being that numbers of them contracted diarrhœa and dysentery from drinking irrigation water, a large per-centage of whom had to be sent all the way to the base, their work being thrown upon their already overworked brethren.

169. As all followers started on the "summer scale" of clothing, and were unable to obtain any extra articles of same from the commissariat or elsewhere on purchase at Dir, they suffered severely from cold between Gujar and Ashreth. Some provision in this respect should have been made for at least those who had to cross the "Lowari Pass" in April when some feet of snow lay on the ground.

Office establishment, equipment, &c. of the Principal Medical Officer of a division in the field.

170. The arrangements for the conduct of his work by the principal medical officer of a division in the field are very far from being like satisfactory. In the first place, he has no medical officer either to act as personal assistant while he is present with head-quarters, or whom he could leave while he is away inspecting to carry on the ordinary routine duties of the office, and be available for speedy reference from the general officer commanding, commissariat staff officer, or other staff officers, or from medical officers on the spot. One result is that when the principal medical officer finds it necessary to go away on such duty he is compelled to take his office and whole establishment with him. Neither has he even one European clerk. Two babus only are allowed who, though possibly excellent men in their own way, and well fitted for work in the cantonments of an Indian station, are totally unsuited to the conditions of field service, or to the climatic and physical difficulties inseparable from campaigning on the frontier, or in Trans-Indian countries, especially when they are badly housed and badly fed. Climbing precipices and fording rivers in full flood are not to their taste, especially when after a day of such work they have to sit up half the night writing, possibly in a wet tent. After the first two months little or no work could be got out of the second clerk, consequently extra work was thrown on the head clerk, who himself was then in anything but good health. Eventually the former said he was ill and went to hospital, where he remained some five weeks. As another babu could not be sent to relieve him, I obtained, though with some difficulty, the services of a soldier-clerk. In a little time this soldier-clerk got ill too, and had to be invalided to the base. Though the amount of clerical work was at this time very great, I had only the one clerk and what intermittent help I could obtain from the different field hospitals we came across. As I was obliged to spend much time in assisting myself at the routine clerical work of the office, I was unable to attend to other duties of a more important nature, more suited to my position and training.

171. The equipment for the office of a principal medical officer in the field is insufficient and unsuitable in nearly every respect. If the duties required of a principal medical officer even of a division in the field are to be carried out in anything approaching a satisfactory way, he should be given a carefully selected senior surgeon-major as "personal assistant" or "secretary," an "orderly officer," and two good trained European soldier-clerks at least. The Commanding Royal Artillery, Commanding Royal Engineers, and other senior departmental officers have all got their staff captains, and I cannot see why a principal medical officer in the field should be expected to carry on his very onerous and important duties without similar help. On the breaking up of the force, too, the latter officer is suddenly deprived of even his babu clerks, and is then expected, in addition to perform his ordinary duties as principal medical officer of a district, or possibly (officiating) of a command, to receive and attend to all the correspondence, queries, references, &c., connected with the lately demobilized force from the various departments of supply and elsewhere; as well as to read over and digest all the reports from medical officers lately in charge of field hospitals and corps units, and quickly submit a carefully drawn up and valuable report on the medical history of the campaign just ended. To compass the amount of work of every kind included in the above without a certain period of leisure and assistance of the very best kind would simply be impossible for any ordinary man. It is true that the Government allows two temporary clerks to be entertained for two months after date of demobilization, but it is not easy, if possible, to find suitable ones at a moment's notice, and even if it was they would be entirely ignorant of everything connected with the force in question, or possibly of official work of any kind or sort. Their time, too, during that period would be fully taken up with the mere compiling of the general returns alone.

Paragraph 109, Field Service Departmental Code, Medical.

172. The regulations should make it clear, if it is still so desired, that British officers of native corps should be shown in the "returns" of native, though treated in British field hospitals. At present great confusion exists on this point.

Morning state of force.

173. It is quite impossible on the frontier, with a widely scattered force, for the principal medical officer to ensure the submission of a "morning state" of sick to the general officer commanding.

Army Form, B. 103.

174. Officers commanding corps are not aware at the beginning of operations, nor for some time after, that they have to render a regimental return of casualties in action, and great delay in consequence is experienced in obtaining same from them.

Casualty reports, &c.

175. Forms for casualty reports on medical warrant officers, rolls of family remittances, and medical requisition forms might easily be reduced in number.

Strengths.

176. It is a most difficult matter to decide how the strengths of corps should be shown in field hospital returns. Some specific instructions on the subject should be laid down in Field Service Departmental Code, Medical.

Sick out of hospital.

177. Men of native corps were frequently treated in their lines and not shown in the statistical returns as they ought to have been.

Disposition Forms.

178. Forms showing the disposition of troops and of field hospitals and sections of same in the field should be printed and supplied to principal medical officers of divisions.

Special circulars on mobilization.

179. As it is difficult at the beginning of operations to get much space in divisional orders for medical orders, a special circular should then be issued to all medical officers told off to field hospitals, sections of same, and corps units, impressing on them their duties with regard to the accurate rendering of returns, *re* British troops, native troops, and followers "urgently" needed by principal medical officers of divisions in the field.

Military Accounts Form, No. 72.

180. The details on Military Accounts Form No. 72, for use when returning lists of medical and surgical stores of field hospitals on demobilization of same, should be printed.

Memorandum book.

181. A "Memorandum" Book (Army Hospital Book No. 23) should be issued to each corps unit in the field.

Weekly Sanitary Report Forms.

182. At the commencement of operations, too, 50 copies of a printed weekly sanitary report should be served out to senior medical officers of "posts," or to each medical officer with troops, if it be still desired that all the latter should send in separate weekly sanitary reports.

Report of Medical Transactions.

Killed and wounded.

183. During the campaign 1 officer and 16 non-commissioned officers and men, British and native, were killed in action; while 12 British officers, 69 native officers, non-commissioned officers and men were wounded, of whom 1 officer and 4 men died in hospital and 76 recovered. The most of the casualties occurred at the storming of the Malakand on April 3rd, where 5 officers, 33 non-commissioned officers and men were hit, the other casualties occurring at the Swat river on the 7th, and at the Panjkora river on the 13th and 14th of the same month. Of a total of 43 admissions among British troops for wounds, 4 died and 39 recovered. Among the native troops there were 34 cases of gunshot wounds, all with one exception being ultimately discharged to duty. The wounded were all promptly attended to on the field, the cases being treated antiseptically from the first, and were quickly passed down to the base hospitals. The character of the wounds is shown in the General Return; they were mainly inflicted by Martini-Henry and Snider bullets.

Principal diseases of British troops.

184. The principal causes of inefficiency among the British troops were malarial diseases, which caused 1,401 admissions, or over one-third of the total; 273 from diarrhœa, 565 from dysentery, 326 from enteric fever, 159 from primary syphilis, and 109 from gonorrhœa.

Malarial.

185. The admissions for malarial diseases were chiefly among the troops quartered in the valleys during the hot weather, or among predisposed men contracting chills either unavoidably or through careless exposure at night.

Diarrhœa.

186. The cases of diarrhœa were chiefly due to chills, and no doubt the nature of the rations, which, if abundant, were not always digestible, tended towards the production of bowel complaints.

Dysentery.

187. The admissions for dysentery were also exceedingly numerous, and may be similarly accounted for.

Enteric fever.

188. The only serious outbreaks of epidemic disease were due to enteric fever. The first occurred at Khar in the Swat valley, principally amongst the Bedford Regiment, but the number of cases there was very limited, and the outbreak did not attain serious proportions till early in July, when the battalion was in camp at Laram Kotal. The total number of cases in this battalion was 123, in the King's Royal Rifles 44, and in other corps 16.

First outbreak.

189. The first case occurred on 29th April 1895 in the King's Royal Rifles, and was probably imported from India. Once the disease was introduced into such camps as the troops occupied first at Khar, and later on at Laram Kotal, and bearing in mind the predisposing influences of the climatic and other conditions of the former place in May, when the men were inactive, the hard work they subsequently underwent, road making, the gradual fouling of the soil through the extension of latrine trenches, the inadequate conservancy arrangements due to the want of a sufficient establishment, it is not difficult to account for the rapid spread of the disease. The milk and bazaar supplies were of course liable to suspicion, but both were under strict supervision, and the outbreak cannot, in my opinion, be attributed to them. The water supply, which was bad at Khar, may also be disregarded as the cause, as, when the troops were moved to Laram, where the supply was excellent, the epidemic increased in virulence. I attribute the disease to the fouling of the ground inevitable in camps, the lack of a sufficient conservancy establishment and the contamination of food, &c., through the agencies of dust and flies, and the necessary crowding, dirt, and intimate contact in which the men lived, often I think carrying infection direct from one to another. The absence of these last conditions goes far to explain the remarkable immunity from the disease that the officers enjoyed.

Second outbreak.

190. The second outbreak occurred at or near Mundah in the 2nd Brigade, where 5 officers and 53 men were treated for this disease during the campaign. The first two cases occurred in the Gordon Higlanders on the 16th and 22nd April and were probably contracted in India. That part of the troops which left Mundah soon after the disease made its appearance remained practically free, while the balance furnished a largely disproportionate number of cases, notably in the Gordon Highlanders, which shows that the spread of the disease was due to local causes. The conditions favouring the disease were obscure, but the using of an unauthorised water supply, and the general but inevitable conditions of camp life at the time, noted above in the case of the first outbreak, are sufficient to account for this one also.

Venereal.

191. Venereal diseases were to some extent prevalent in the early stage of the campaign, some of the cases being contracted at Nowshera and Hoti Mardan *en route*.

Debility.

192. Debility, the result of hardship, unsuitable food, and probably a malarial taint, was another prevalent cause of disability, 76 men being admitted from this cause.

193. Other diseases were not unduly prevalent, and do not call for special remark.

Diseases of native troops.

194. In the native troops the total number of admissions was 3,119 on an average annual strength of 4,581. The chief causes of sickness were malarial diseases (1,025), dysentery (609), debility (182), diarrhœa (193), and rheumatism (48). Only one case of enteric fever occurred. The malarial diseases, diarrhœa, dysentery, and debility were all, no doubt, due to the same conditions as caused similar admissions among British troops, while the absence of enteric fever illustrates the remarkable immunity of natives to this disease.

Of followers.

195. Among the followers the admissions numbered 3,587 on a strength of 7,118, and were almost the same in character as among the native troops.

RETURN showing the **AVERAGE ANNUAL STRENGTH, ADMISSIONS INTO HOSPITAL** and **DEATHS** among the **BRITISH TROOPS** composing the **CHITRAL RELIEF FORCE** from March to October 1895, with rates per cent. per annum.

Average Annual Strength,	Officers, 129.				W. Officers, N.C. Officers and Men, 2,571.			
Diseases.	Admissions into Hospital.	Deaths.	Rate per cent. Admissions.	Rate per cent. Deaths.	Admissions into Hospital.	Deaths.	Rate per cent. Admissions.	Rate per cent. Deaths.
I.—GENERAL DISEASES.								
GROUP "A."								
Sub-Group I. Small-pox	—	—	—	—	—	—	—	—
Sub-Group I. Other Eruptive Fevers	—	—	—	—	—	—	—	—
Sub-Group I. Enteric Fever	13	2	10·1	1·55	326	94	12·7	3·66
Sub-Group I. Other Continued Fevers	14	—	10·9	—	105	—	4·1	—
Sub-Group I. Cholera	—	—	—	—	—	—	—	—
Sub-Group I. Dysentery	27	—	20·9	—	565	20	22·0	·78
Sub-Group I. Other Diseases	—	—	—	—	1	—	—	—
Total	54	2	41·9	1·55	997	114	38·8	4·44
Sub-Group II.—Malarial Fevers	68	—	52·7	—	1,401	3	54·5	·12
Sub-Group III.—Septic Diseases	—	—	—	—	1	—	—	—
Sub-Group IV. Syphilis, Primary	—	—	—	—	159	—	6·2	—
Sub-Group IV. " Secondary	—	—	—	—	97	—	3·8	—
Sub-Group IV. Gonorrhœa	—	—	—	—	100	—	4·2	—
Total	—	—	—	—	365	—	14·2	—
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—	—
GROUP "B."								
Sub-Group I.—Parasitic Diseases	—	—	—	—	5	—	·2	—
Sub-Group II. Scurvy	—	—	—	—	—	—	—	—
Sub-Group II. Alcoholism	—	—	—	—	—	—	—	—
GROUP "C."								
Debility, &c.	4	—	3·1	—	76	—	3·0	—
GROUP "D."								
Rheumatism	2	—	1·5	—	94	—	3·7	—
Tubercular Diseases	—	—	—	—	6	1	·2	·04
Other Diseases	—	—	—	—	11	—	·4	—
II.—LOCAL DISEASES.								
Diseases of the—								
1. Nervous System. Nervous Diseases	2	—	1·5	—	9	—	·3	—
1. Nervous System. Mental "	1	—	·8	—	3	—	·1	—
2. Eye	—	—	—	—	15	—	·6	—
3 & 4. Other Organs of Special Sense	1	—	·8	—	26	—	1·0	—
5. Circulatory System	—	—	—	—	7	—	·3	—
6. Respiratory "	2	—	1·5	—	40	2	1·5	·08
7. Digestive "	30	1	23·3	·78	483	6	18·8	·23
8. Lymphatic and Glandular System	—	—	—	—	48	—	1·9	—
9. Urinary System	—	—	—	—	7	1	·3	·04
10. Generative "	—	—	—	—	55	—	2·1	—
11. Organs of Locomotion	1	—	·8	—	21	—	·8	—
12. Connective Tissue	3	—	2·3	—	56	—	2·2	—
13. Skin	3	—	2·3	—	64	—	2·5	—
III.—POISONS	—	—	—	—	5	—	·2	—
IV.—INJURIES.								
1. General	1	—	·8	—	3	—	·1	—
2. Local	6	—	4·7	—	118	1	4·6	·04
3. In Action	8	1	6·2	·78	35	13	1·4	·51
No appreciable disease	—	—	—	—	19	—	·7	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—
General Total	186	4	144·2	3·10	3,970	141	154·4	5·49

REPORT on INJURIES caused by the LEE-METFORD RIFLE observed in CIVIL DISPENSARY, CHAKDARAH, among the enemy's wounded, by SURGEON-LIEUTENANT D. W. SUTHERLAND, I.M.S.

Some 16 cases of Lee-Metford injury were observed by me altogether, and were seen at varying intervals of time after being struck; some having come into hospital a few days after receipt of the injury, and others not until two, three, or four months later.

The cases are first briefly enumerated in detail, and were as follows:—

Case I.—Said Hussan, aged 22, resident of Derai Village, Raniyan. He was shot upon the Malakand on the 3rd April 1895 by a bullet from a magazine rifle which struck him in the left hand and passed through it. The bullet first struck the radial side of the base of the first phalanx of the left index finger, entering obliquely, then passed upwards and backwards through the base of the first phalanx through the metacarpo-phalangeal joint of the index finger and through the distal end of the second metacarpal bone, simply perforating them all. It then entered the side of the third metacarpal bone about its middle, not fracturing the bone, but raising a little of its outer shell, and then emerged from the dorsum of the hand obliquely, just over the centre of the third metacarpal bone. He stated that he was only about 15 yards distant when struck, that there was not very great discomfort on receipt of the wound, and that both wounds, exit and entrance, were healed up in about 7 or 10 days. He came to me early in June complaining of a stiff hand, and on examination I found the tendon of the middle finger was adherent to the scar of exit and the cause of the trouble. The entrance scar was small and ovoid, while that of exit was more linear in character and irregular. There was good movement in the metacarpo-phalangeal joint which had been perforated, and no evidence of fracture or fissuring.

Case II.—Hadji Pir, aged 85, resident of Village Battchela, Raniyan. He was wounded behind the left shoulder in the Malakand engagement on 3rd April, and came to me early in August to show the scars and effects.

He was a very well-preserved old man, and told me that he was upon the Malakand ridge on the day of the fight, and while taking aim at a man to his left front he was shot by a magazine rifle bullet from his right rear at some 30 yards distance. The gun fell from his hand when he was struck, but he himself did not fall. He then picked up his gun and made away to the hills, upon which he stayed for the next three days and nights. There was much pain on being struck, and very severe bleeding, which lasted for three days in which he stayed on the hills. In a month both wounds healed completely, but he came to me early in August complaining of a stiff shoulder and difficulty in moving the scapula. At that time he had a scar of entrance upon the left side of the back about 2½ inches external to the 6th dorsal spine. This scar was somewhat linear and about half an inch in length. From the position of the scars of entrance and exit the bullet had apparently entered just internal to the vertebral border of the left scapula, but grooved the 5th rib and passed through the subscapular fossa and the subscapular muscle, and had then emerged through the axillary border of the scapula. The exit scar was also somewhat linear and rather less in size than the scar of entrance, and was situated behind the posterior fold of the axilla, and about half an inch above the inferior angle of the scapula. There was no deformity of the bone indicating a past fracture, and the bullet had evidently simply perforated.

Case III.—Asaat, aged 32, resident of Battchela, Raniyan. He was wounded upon the Malakand on 3rd April by a bullet from a magazine rifle. He came to me early in August, and I found that he had received a wound from a bullet which had passed through his buttocks, and had perforated his rectum. There was a scar of entrance behind the right great trochanter, small and circular, and less than the diameter of the bullet. From thence the bullet had passed almost transversely to the left, but slightly upwards, and had emerged in the left buttock, external to the ischial tuberosity, and at the level of the upper part of the great trochanter. In this place there was a small pink, recently-healed scar of slightly greater extent than the scar of entrance. The bullet had passed just in front of the lower part of the sacrum, and had perforated the rectum, for there was a history of much bright red blood in the stools for the first three days after the injury, and he used to break wind through the exit hole of the bullet for fully a month afterwards. The entrance wound healed in eight days after the injury, but the exit wound took our months to heal, and had only really repaired four days before I saw it. He was upon the Malakand ridge on 3rd April, and was shot by a Highlander from the foot of the pass about 1,000 yards range. When struck, he at once fell to the ground, and was lifted and carried from thence to his home by friends. There was much bleeding from both wounds for some five days afterwards.

Case IV.—Sirgum, aged 48, resident of Battchela, Ranizai. He was in a "Sangar" on the Malakand pass on 3rd April during the engagement, until the cry went up that that the Guides had gained the ridge above on his left. On hearing the cry he turned towards the ridge to fire and straight away received a Lee-Metford bullet through his left shoulder, of what he thinks would be 100 or 150 yards range. He came to me early in August to show the injury, and had then a scar of entrance behind the left shoulder over the hinder border of the deltoid, about one inch below the spine of the scapula. This scar was small, slightly larger than the diameter of the bullet, and irregular: the bullet had then evidently passed forwards and downwards, perforating the humerus below the greater tuberosity, and had emerged through the centre of the deltoid about half an inch below the acromion. The scar of entrance is small and punctured, and the fibres of the deltoid in that immediate neighbourhood are wasted and atrophied, probably from a division of some of the circumflex branches of supply. He gives the history that the bullet struck with some amount of force, but did not cause much pain. His gun was in his right hand at the time, and he did not drop it, nor did he fall himself. There was very much bleeding at the time, and which lasted for some nine hours afterwards. He stayed upon the hills that day and went home at night. He treated the wounds himself by the application, first of the fleshy side of a fowl's skin, and afterwards by poultices. In 15 days the entrance wound healed, and in one month the exit wound filled up. Two pieces of bone came out from either wound.

Case V.—Dindar, aged 45, resident of Battchela, Ranizai. He was in the Khar fight on the 4th April, and was shot by either the Bedfords or 60th Rifles with a Lee-Metford bullet through the right thigh. He came to me only in August, so that notes might be made upon his injury, and had then a scar on the outer side of his right thigh, just about the junction of its upper and middle thirds, where the bullet had entered. From an oblique entrance of the bullet this scar was larger than usual, and about twice the size of the diameter of a magazine bullet. The bullet entering the thigh at this place had passed upwards and backwards and very slightly outwards, perforating the femur below the great trochanter, without causing fracture. The scar of emergence was situated immediately over the bone, about 2½ inches below the tip of the great trochanter, but situated behind the body of the trochanter. Both scars were freely movable, and the exit scar in like manner to that of entrance was largish from an oblique emergence. He tells that he was some 1,000 or more yards distant when struck, and that he immediately fell to the ground, not so much from the severity of the injury, but from his being what he calls a "kam-dil" (feeble-hearted) man. The bullet, he narrates, struck him with force, and the wound caused him much pain. The hæmorrhage from the wound at the time was very great. He was lifted by four of his friends and carried home, and both the wounds of entrance and exit were completely healed five days afterwards.

Case VI.—Hukum Shah, aged 48, resident of Battchela, and a syphilitic subject. He was upon the top of the Malakand Kotal on 3rd April 1895 during the storming of the pass, and has quite an interesting story to tell. At first he was half sitting, half kneeling on the edge of the cliff, hurling down stones upon the British soldiers as they passed upwards. In a while the cry went round that some of the British soldiers had gained the ridge. On hearing this he half rose up and drew his tulwar, but when the blade was about three-quarter ways out of its sheath he was struck by a Lee-Metford bullet in the right forearm. Dropping his tulwar at once he grasped the wounds with the thumb and fingers of his left hand, and bent his head. Just then another bullet from behind skimmed along the middle of his back between his shoulders, causing him to throw back his head and spring to his feet. As he did so a third Lee-Metford bullet passed in at his left groin and out behind, leaving him much wounded. He tells that there was much bleeding from the wounds and great shock; but he got away and stayed all night upon the hills, not venturing home until next day. He states that there was not much pain, and puts down the range at which he was struck at 100 to 150 yards. He came to me in Alsdand on 7th April, and I dressed the former wound, but did not then know of the graze upon the back, nor the wound in the groin. On that day, three days after the fight, he walked some five miles to have the wound dressed, and kept up with a regiment marching (the whole way). At that time he had a small entrance wound on the back of the humerus. It was rather smaller in size than the diameter of a magazine bullet; had inverted edges, and a smooth circular outline, and had begun to heal. He told of great bleeding at the time of the injury, but when I saw it there was none. The bullet entering the forearm here had passed then upwards and inwards, and had emerged below the bend of the elbow, through the pronator radii teres, and just lower down than the coronoid process of the ulna. The bullet in its passage had perforated the shaft of the radius to one side of its centre, and had lifted a portion of the shell of the bone, but had not caused fracture. The exit wound was small and circular in character, like the wound of entrance, and with slightly everted edges. Early in August I again saw him, and then he only showed on his forearm two small circular scars of less size than the diameter of the bullet, each having a coppery tinted areola around it from his syphilitic constitution. He stated that the former wounds healed up within seven days after the injury. In August he displayed a second Lee-Metford bullet wound which he had in his left groin, the entrance part of which was still a discharging sinus. The bullet struck in the inner part of the left groin, well inside the femoral vessels, and just below Poupart's ligament, then passed backwards and outwards, and emerged through the left buttock at a point slightly internal to midway between the great trochanter of the femur and the ischial tuberosity. In its course it must have passed through or have grazed the hip joint, and at present the persistence of the discharging sinus may be due to some spicules of dead bone deep down in the wound. The entrance wound when seen was still small and little larger than the bullet, while posteriorly there was a small, irregular, and pigmented scar. He told of great bleeding at the time of the injury and some amount of shock, but not sufficient to prevent him getting away unaided to the hills, upon which he stayed the whole night before venturing home. In neither of the wounds was there much pain, but the groin wound caused rather more discomfort than the forearm wound. The buttock exit wound healed up in about 12 days, but the groin entrance wound is still unhealed. He thinks he was about 100 yards distant when struck. The graze of the back has left no scar.

Case VII.—Maashal, aged 60, a Lumbidar of Battchela, Ranizai, was shot upon the Malakand by the British in two places on 3rd April 1895. The first bullet struck the back of the left upper arm near the elbow, just above the external condyle, where it had left a small irregular scar, and less than the diameter of the bullet. It then perforated the lower end of the humerus in a direction forwards and somewhat upwards, and emerged about one finger's breadth above the bend of the elbow, 2½ inches above and internal to the external condyle of the humerus. The scar of exit was very minute, and resembled a small pit after small-pox. There was no evidence of fracture of the humerus at the seat of injury or implication of the elbow joint, which was freely movable, but a roughening was left on one part of the external supra-condylar ridge of the humerus, as if a fissure had extended out to these. There was the history of very severe bleeding at the time, which continued from both wounds for about three days. The pain was only slight, but the bullet struck somewhat forcibly, though not sufficient to make him fall. The range he gave as only about 20 yards, as he was near enough to hurl stones, but he cannot definitely fix it, for he said the bullets fell at that time like rain. Both wounds were entirely healed in 12 or 13 days. The first wound caused him some inconvenience, and he continued the fight to get, three-quarters of an hour later, a bullet through the jaw. This also was a magazine rifle bullet, and struck him beneath the chin in the lower and fore part of the left submaxillary triangle, the scar of which in August was hardly visible. The bullet then passed upwards and to the right, crossing the middle line of the neck, and just opening into the floor of the mouth, after which it perforated the lower jaw, just outside the incisive fossa, and in its emergence detached a portion of the outer plate of the jaw, which was afterwards cast out as a sequestrum. The jaw itself was not fractured. From this wound there was great pain and much bleeding, and upon receipt of it he discontinued the fight and went home. The entrance wound healed in 25 days, but the exit wound took fully two months to become well, and when seen in August was represented by a linear scar.

Case VIII.—Muhammad Ghulam, aged 40, resident at Battchela, Ranizai. He, in like manner to Case VII., was shot in two places upon the Malakand by magazine bullets. The first bullet struck the outer side of the right fore-arm about 4 inches above the wrist, and when seen by me in August the place was marked by a small dark raised scar. The bullet had passed downwards and inwards through the radius which it had perforated in its passage, but, curiously enough, had fractured at the ordinary seat of Colles' fracture lower down, and now the hand has a very typical Colles' distortion. After perforating the radius it then passed through the ulna, lifting a few portions of the shell of the bone in its emergence. The scar of exit was of largish size and irregular, being about 2½ inches long and ½ inch wide, while it had begun to assume a cheloid character. He gave the history of little pain upon receipt of the injury, but of great bleeding. He fell upon his side when struck, but rose afterwards, and went unaided to his home. The entrance wound healed up in 12 days, but the exit wound took three months to heal up, during which time some pieces of bone came away. The site of the wound of exit was about 1½ inches above the wrist joint in the inner side of the forearm towards its posterior surface.

After receiving the above wound he was sitting upon the ground supporting his right hand when a second magazine bullet struck him in the right upper arm, fired from what he thinks would be from 20 to 50 yards' distance. This bullet passed in through the upper part of the outer surface of the right arm just at the apex of the deltoid attachment, and perforated the humerus without causing fracture, and then emerged in the axilla below the inner border of the deltoid, just below the insertion of the pectoralis major into the bicipital ridge. Both the entrance and exit scars, when seen, were rounded, small, and raised, and had the peculiar cheloid character of the forearm scar. He told that this wound caused little pain, but that a great amount of blood came from it at the time and afterwards. Both the entrance and exit wounds healed within a month.

Case IX.—Makam, aged 25, resident of Battchela, Ranizai. He received a Lee-Metford wound of the soft parts of the inner side of the right thigh in the Malakand engagement on 3rd April 1895. The bullet struck the upper part of the inner side of the right thigh and passed through the adductor muscles. From the rounded contour of the limb the scars of entrance and exit were larger in size than usual, and somewhat transverse to the limb in position. The bullet, he declared, struck him with some force, and caused severe hæmorrhage, but gave rise to little pain. He did not fall when struck, and reached home unaided. The range could not, from his statement, have been more than 50 yards, for he was near enough to throw stones. Both wounds were completely healed within a month.

Case X.—Kasum, aged 30, resident of Battchela, Ranizai. He sustained a Lee-Metford wound of the left shoulder on the Malakand on 3rd April, and showed me the scars early in August. The bullet struck his left deltoid, near the hinder border, and passed backwards through the teres and infraspinatus muscles to lodge in the substance of the latter, below the spine of the scapula and near its vertebral border. The bullet was removed in Chakdara by some medical officer belonging to the Chitral Relief Force early in April. The entrance wound had a small round scar which was very slightly marked. He could give no description of the appearance of the bullet when removed. The entrance scar was over the hinder border of the left deltoid, and about 3 inches below the left acromion. There was great pain at the time of the injury and much bleeding, while he stated that the bullet struck with great force. The distance he declared to be about 100 yards. Both wounds were healed in 13 or 14 days.

Case XI.—Astun, aged 50, Malik of Battchela, Ranizai. He was struck in the lower part of the left armpit in the Malakand fight by a spent ricochet Lee-Metford bullet, which lodged beneath the posterior fold of the axilla, and which he extracted himself. He displayed the scar to me in August and handed the bullet over to my possession. The bullet proved the hinder part of the case of a Lee-Metford bullet, without its case, and was flattened anteriorly—evidently from previous contact with a rock or some such thing. A dark scoring of the skin in the left armpit when seen led upwards and backwards for about 2 inches to an irregular scar of less than half inch diameter. The bullet he declared to have been lodged about 2 inches deep, and he himself removed it with a knife. The injury caused great bleeding for two days and great pain, both of which continued until the bullet was removed. He did not leave the hill at once, but continued the fight, staying upon the hills with his men until evening time. The wounds entirely healed up within 12 or 13 days. He was distant about 300 or 400 yards when struck.

Case XII.—Nassar, aged 20, son of Malik Astun (Case XI.). He in like manner to his father was wounded upon the Malakand by a Lee-Metford bullet, which by a curious coincidence also lodged. The bullet seems to have been the fore end of a spent Lee-Metford ricochet, and struck him in the upper part of the right side of the neck, in the apex of the posterior triangle, behind the sternomastoid, and lodged. It left a scar which, when seen by me in August, was scarcely visible. The boy told that the bullet perforated the muscles of the back of the neck for about one inch, and was removed by a friend who was with him. The pain he declared to have been slight, but the bleeding was severe. He was only 20 or 30 yards distant when struck, near enough, he stated, to throw stones. The wound healed up under native treatment in 12 or 13 days.

Case XIII.—Asap, aged 30, resident of Battchela, Ranizai. In the Malakand fight on 3rd April he was struck by a Lee-Metford bullet fired at some 30 to 50 yards to his left front, which passed across the front of his body about his waist, pierced his powder bag and leather bag of bullets, which hung at his right side, and struck his right forearm near the elbow, where it lodged. He was seen by Surgeon-Lieutenant A. H. Morehead, I.M.S., early in April, who cut down upon the part and removed the hinder portion of a Lee-Metford case, which had been rent as an ordinary percussion cap is rent after percussion, and several pieces of lead as well. He came under my care early in June, and had then an irregular discharging wound over the upper part of his right forearm on the inner side. Some fragments of a bullet were to be found on probing, and an incision showed a portion of a Lee-Metford case and some fragments of lead still lodged in the part, which I accordingly removed. There was great pain he stated when struck and very severe bleeding. The wound took fully two months to heal owing to his infrequent attendance at hospital for treatment.

Case XIV.—Rundulla, aged 35, native of Thana, Baizai. He was struck upon the Malakand by a Lee-Metford bullet, which passed through his left elbow joint. The bullet entered on the outer side of the joint between the head of the radius and the external condyle of the humerus; then passed inwards and slightly upwards through the elbow joint, perforating the internal condyle and emerging just above the internal condyle on the inner side of the joint. He came to me early in July, complaining of stiff elbow, and had then a small open sinus at the point of entrance, which even then was of less size than the diameter of a Lee-Metford bullet, while the point of emergence was represented by a minute scar with one or two small scars about it, through which places, from his story, minute fragments of bone had come a few days after the injury. There was no deformity of the elbow indicating fracture at the time, and the stiffness was due to a few fibrous adhesions which were easily broken down under chloroform, and the utility of the joint restored. He stated that he was about 400 yards distant when struck; there was not much pain caused nor much bleeding. He continued to use his left arm in the fight, and was shortly afterwards struck by a fragment of some bullet in the right joint. After the fight he walked home to Thana, some nine miles. The entrance wound was not healed when I saw him, but the exit wound he said had closed up in about 14 days.

Case XV.—Said Akbar, aged 32, resident of Udagram, Babozai, Upper Swat. He appeared at my dispensary late in July with incipient musculo-spiral paralysis of the right forearm, following upon a Lee-Metford wound of the upper arm, received in the Malakand fight, while sitting upon the ground waving a tulwar. The bullet had entered the upper end inner side of the arm, just over the attachment to the bone of the inner head of the triceps, and had then passed obliquely downwards and outwards through the humerus to emerge on the outer side of the arm in the neighbourhood of the musculo-spiral groove. The entrance scar was small and round and free, but that of exit was linear and large, while the man told of a piece of bone having come away during the first week after the injury. I cut down upon the point of exit on 27th July 1895, and found that the bullet had simply perforated and had not fractured the humerus, but where it did emerge, on account of coming out obliquely, it had lifted up one or two portions of the bone with the periosteum attached and had thrown them outwards. These bits of bone had then become adherent in their new situations instead of falling back into position, and one of the pieces had become adherent as well to the musculo-spiral nerve, and this had brought about the commencing paralysis. The man stated that he was struck at about 30 yards' distance. The entrance wound healed in 15 days and the exit had closed up within a month.

Case XVI.—Mohammed Sharif, aged 38, resident of Galigoe, Abatchal, Upper Swat. He was shot upon the Malakand on 3rd April by a Lee-Metford bullet, which passed through his right thigh and fractured the shaft of the femur. He came to me early in August with a very badly united fracture of the femur after Lee-Metford injury, with great shortening and inversion of the limb. There was a small, round, characteristic scar over the front of the middle of the thigh where the bullet had entered, which was very freely movable, and behind, immediately opposite, was an irregular, depressed scar, more linear in nature, about ¾ inch long and adherent to the bone. The femur had been fractured a little above its centre, and the upper fragment had been rotated upwards and somewhat outwards; the lower fragment had been drawn upwards on the outer side of the upper and overlapped it for about 4 inches. The limb below the seat of fracture was adducted and the foot had fallen inwards. On 14th August I cut down upon the seat of fracture with a view to resection of the fracture and restitution of the form of the limb. I found then that there had been a compound and very much comminuted fracture of the shaft of the femur, just above its centre. About an inch of the bone where the bullet had struck had been broken into fragments, and the muscles and parts about were filled with portions of bone. Fissures extended for some little distance up and down the shaft, and there were a vast number of osteophytic projections from both ends of the bones; probably from a periostitis after the injury. The fractured ends of the bones were a good deal splintered and broken off, and even largish pieces of bone were lying in the parts about. All osteophytic projections were removed, the ends were sawn off the bones and the limb brought into good position, after which the periosteum was united and the wound closed. The man is still in hospital and is doing well. He gives the history that he was about 150 yards away when struck, and that he straight away fell to the ground with great pain and shock. There was a great deal of bleeding from the wound at the time and afterwards. He was lifted by his friends and carried home to Galigoe. The entrance wound healed in about one month and the exit wound in one and a half or two months.

Case XVII.—This case came under the care of Surgeon-Major Esmond-White, A.M.S., and Surgeon-Lieutenant A. H. Morehead, I.M.S., at Camp Khar in April, and they have kindly supplied me with particulars concerning it. This man was struck in the Khar fight on 4th April by a Lee-Metford bullet in the face. The bullet entered the upper part of the right cheek, through the molar process of the superior maxillary bone, then passed obliquely upwards and inwards through the nose and the hinder part of the left orbit, after which it entered the anterior fossa of the skull, perforated the frontal lobe of the brain, and emerged in the left temporal region. At the time of observation both wounds of entrance and exit had healed, the facial and skull bones had evidently been simply perforated, and there was not a single bad symptom.

The comparatively small number of cases noted above are hardly sufficient to allow one to make a definite deduction regarding the injuries caused by the Lee-Metford bullets, but, taken in conjunction with cases previously reported by others, they may prove of use in arriving at general conclusions as to the severity or non-severity of Lee-Metford wounds. In the observation of the cases herein reported I have been impressed by the slight shock in most cases at the time of injury, the comparatively slight amount of injury done to the bones and soft parts, the profuse bleeding in all cases, and the usual rapidity of healing of the wounds. The natives themselves comment freely upon its want of force in striking, and think it in their minds quite a drawback to the effectiveness of the bullet. They wonder at its long range, and at two, three, or more men being perforated by one bullet. Among the cases that I have seen, as a rule, there has been little shock when the bullet passed clean through the parts, saving in the case of fractures of the shaft of the femur where the shock was great from the severe nature of the injury. The cases where the bullet lodges seem to suffer more shock than those in which the bullet passes simply through, probably from the former being associated with more pain and stunning. The pain in most cases has been slight, and the man shot through his elbow says he was "so excited during the fight that he did not "feel the pain at all." This lack of shock and pain is important, for in several of the instances narrated it allowed the man to continue the fight and perhaps to receive a second injury; or, what is also of importance, allowed him to get easily away and to become ready to fight again in a few days.

The severe hæmorrhage from the wounds is very striking and of almost universal occurrence. The bullet evidently clearly cuts the vessels, or opens into them, and the ordinary natural arrest of hæmorrhage does not get a good chance to take place. The men seen tell of severe bleeding persisting for hours or days, and of their clothes being soaked in blood from the amount of its flow. Wounds of large blood vessels with this bullet would probably prove fatal from the great and early loss of blood.

The injury to the bones in most of the cases has been remarkable, for only in two instances has there been fracture of the bones, in Case VIII., where the radius broke in the seat of Colles' fracture and not at the site of injury, and in Case XVI., where the former was extensively fractured by a shot, striking it fairly in the centre. In nearly every instance the rule has been simply perforation of the bones, but in Cases VI., VII., VIII., and XV., the outer shell of the bone has been splintered and raised by an oblique emergence of the bullet. It is perhaps possible in some of these cases, that, had the bullet struck transversely instead of obliquely, fracture might have taken the place of perforation in the effects. From such oblique emergence in cases splinters are thrown off from the surface of the bone, and prevent the usual rapid healing of the wound. They may be discharged within the first few days, if small, but, if large and unless artificially removed, may set up suppuration and form an open discharging sinus. Caries or necrosis in the track of the bullet in simple perforation cases I have not noticed, and usually the wounds rapidly heal.

The healing of the Lee-Metford wounds is, as a rule, very rapid, and good cases seem under native treatment to heal from 7 to 14 days. This native treatment is the lavage of hot oil to stop the bleeding, and then the application of the raw moist side of the skin of a recently killed fowl or sheep for a few days, after which application of herb poultices are made until the wounds heal. With careful antiseptic precautions it is likely that they would heal much sooner, and I should imagine from 5 to 15 days would then be the rule.

On inquiring from the natives their views as to the results of the weapon, they tell that "those of them shot in the head died at once on the field, those wounded in the abdomen often died at once, but many reached their houses to die there in a few days; while those wounded in parts other than the head or abdomen all recovered." This statement seems fairly near the truth from what one can judge by careful inquiries among the people. The dead in most cases seem to have been those who received head and abdominal wounds, but all who received such wounds did not necessarily die. Surgeon-Major White's case is one in point, where the bullet passed through the anterior lobe of the brain with complete recovery. Several of the abdominal cases reached their villages, and only died on the second or third day from secondary peritonitic inflammation. Chest wounds, so far as one can learn, all did well, where only the lungs were perforated, but with an injury to one of the larger vessels of the chest by a Lee-Metford bullet one cannot conceive of life persisting. The ordinary wounds of the extremities, with or without perforation of the bones, seem all to have done well, and cases of many perforations without a fatal result are recorded. Two or three perforations of the extremities, or extremities and chest, are quite common in the villages, while, in some, instances even with six and seven perforations can be shown who are still living. The fact of smokeless powder having been used with the magazine rifle has passed almost unnoticed by the natives, very few of whom have even an inkling that such powder was used.

From the observation of those cases and information gained by conversation with the people, it would seem that a desperate man such as a "Ghazi" would hardly be stopped in a charge by one or two bullets from a Lee-Metford rifle, unless struck in the very vital places of the head and abdomen, and the per-centage of injuries in these places compared with the extremities is small indeed. From what one can learn an abdominal wound from the magazine rifle is not associated with very much shock, and some of the cases struck have been able to go to their homes afterwards, some of them even walking great distances. Wounds of the upper extremity, I should think, would not, as a rule, incapacitate a man in a rush, and wounds of the lower extremity only when the tibia or femur was fairly struck and not obliquely entered, for in the latter case I could conceive the person continuing the rush.

In conclusion, I shall venture to submit these unselected cases of Martini-Henry injury from our weapons in this campaign, so that a comparison may be made with the Lee-Metford injuries recorded above.

Case A.—Iwas, aged 38, resident of Thana Adingai. He was present at the taking of the Swat river, crossing on the 7th April, and was shot by the IVth Sikhs with a Martini-Henry bullet which lodged in the lower part of the left thigh. The bullet entered the lower end of the femur, at the upper part of the trochlear surface, and between the condyles, and lodged. As a result of the injury the condyles of the femur were wedged apart for some distance, and the shaft of the femur split up. So great was this wedging apart of the femoral condyles that the whole patella fell into the gap, and the knee-joint was rendered useless. It was in that state when seen by me in June 1895, and had the lower end of the femur enormously increased in circumference.

Case B.—Yar Ali, aged 24, resident of Derai, Ranizai. He was present in the Khar fight on 4th April, and was shot with a Martini-Henry bullet by the 37th Dogras. The bullet struck the front of the left shin about its middle, and split into two pieces. The main fragment continued on and passed through the shaft of the tibia, fracturing and comminuting it, and then left at the back of the leg. After this it entered the back of the left thigh (the man being in a sitting position when struck) and passed out in front at the apex of Scarpa's triangle. The tibia was comminuted and fractured, and required operative treatment afterwards. The smaller fragment passed out of the inner side of the left leg and lodged in the opposite thigh, from whence I removed it on 19th June 1895.

Case C.—Haroon, aged 26, resident of Musakhell, Upper Swat. He was shot also in the Khar fight by the 37th Dogras on the 4th April by a Martini-Henry bullet. The bullet entered the back of the left calf, leaving a smaller scar in healing and passed out in front, fracturing the fibula, below its neck, and making a compound comminuted fracture of the tibia. A large lacerated wound was left on the front of the leg where the bullet emerged, and, when seen by me in August, spicules of bone were protruding. Both the tibia and fibula had united in bad position, and the leg was bent outwards like a bow. On the 11th August I resected the fracture and removed a portion of the fibula to get the limb straight. The man [24th August] is still in hospital.

APPENDIX No. IV.

REPORT ON MEDICAL TRANSACTIONS OF THE BRITISH TROOPS OF THE DONGOLA EXPEDITIONARY FORCE FROM 22ND MARCH 1896 TO 13TH OCTOBER 1896.

By Surgeon-Lieut.-Colonel A. T. SLOGGETT, Army Medical Staff, Senior Medical Officer, British Troops.

Composition of force.

The British troops left Cairo on Sunday, March 22nd, 1896. A detachment of 25 Royal Engineers had preceded them two days before, and Surgeon-Captain C. J. Holmes, Army Medical Staff, went in medical charge of this. The force consisted of the 1st Batalion, North Staffordshire Regiment—strength: officers 25, men 869—and, in addition to the Medical Staff Corps, there were the following details:—Army Service Corps 2, Ordnance Store Corps 3, and Army Pay Corps 1; the total British force being 33 officers and 923 men.

Medical arrangements.

On account of the force being expected to remain at Wady Halfa throughout the summer, a field (or rather a specially equipped) hospital, fully equipped for 100 beds and provided with all necessaries, was taken; the medical officers who proceeded, were as follows:—

Surgeon-Major A. T. Sloggett, in medical charge and Senior Medical Officer,

Surgeon-Captain C. J. Holmes, M.D.

Surgeon-Captain H. Carr, M.D.

With Quartermaster and Honorary Lieutenant J. B. Short, and 26 non-commissioned officers and men, Medical Staff Corps.

The force left Cairo by two special troop trains, one leaving at 4 p.m., the other at 5 p.m., and, after a long and tedious journey of 22 hours, arrived at Ballianeh; here the whole force embarked for Assouan.

The arrangements for transport up the river were as follows:—Two of Messrs. Cook and Sons' largest steamers, the "Rameses the Great" and the "Ambigole," with four barges attached to each steamer, *i.e.*, one lashed on each side as latrine and cooking barges, and two towed behind, one carrying live bullocks for fresh meat, and the other firewood.

The headquarters and about 600 of the regiment embarked on board the "Rameses the Great," and the remainder, about 300, embarked on board the "Ambigole," with whom proceeded Surgeon-Captain H. Carr and a small detachment Medical Staff Corps. The accommodation was ample. The steamers each day started at daylight and anchored for the night alongside the bank. Assouan was reached at noon on 29th March; from here the troops had to march to Shellal, a distance of about seven miles, to re-embark again on steamers. Two trains were provided for the conveyance of stores, and gangs of convicts in chains to do the fatigue work. The confusion was very great, as orders had been received that the British troops were to be pushed on to Wady Halfa with the utmost haste. As a matter of course, it was impossible to prevent things from getting mixed. By the time the two trains were loaded it was nearly dark; not sufficient trucks had been provided (I believe, as a matter of fact, there were no more), and as it was considered absolutely necessary that everything should be got on to the two trains, the trucks were piled up with baggage, tents, and stores of every description. Naturally on the journey across to Shellal a quantity of things fell off; however, no hospital equipment was lost. On arrival at Shellal it was quite dark, and we received orders saying the steamers on which we had to embark, four in number, were to leave at daybreak, so that all stores were to be got on board during the night.

The men of a native Egyptian regiment and a large force of chained convicts were ready to unload the trains and reload the stores on the steamers. The confusion that ensued can be better imagined than described, although the most strenuous efforts were made to prevent the different stores belonging to the different corps from being mixed. In 10 minutes it was absolutely hopeless, and the only thing that could be done was to try and get everything embarked safely, and hope that at Wady Halfa it would be possible to sort them out again. As a matter of fact, this was done satisfactorily, though it entailed several days' hard work, for, needless to say, the regimental stores and equipment, Army Service Corps stores, ordnance, and hospital were all mixed up together. Afterwards, at Wady Halfa, I had the whole of the tents, stores, and equipment belonging to the hospital marked F.H. in black paint, and I afterwards found this an immense benefit, as it was impossible for anyone to take them away.

The force arrived at Wady Halfa at noon on Thursday, April 2nd. The quarters for the troops consisted of long mud huts, *i.e.*, the ordinary barrack rooms of the Egyptian Army soldiers. The walls were thick and ventilation was ample, but the roofs were only made of a single layer of deal boards nailed together and resting on iron rails. There was no hospital or special hospital accommodation, so I chose the two best huts and utilised them as a hospital, at the same time selecting one close by for the detachment Medical Staff Corps, and other huts for the office, surgery, steward's and pack stores, &c., &c., &c.

I equipped the hospital for 50 beds. Angarubs, (*i.e.*, native bedsteads like Indian charpoys, but better), were provided, also a supply of zeers for filtering (or rather clearing) water, and the place was made very comfortable.

Wady Halfa, on our arrival, was a large garrison town; some 6,000 troops of the Egyptian Army were there, all busily engaged in fatigue work. Enormous masses of stores were arriving daily from the north, and railway plant, &c., was being pushed forward to the south as fast as possible.

Water supply.

As the British force was quartered to the north of the Egyptian Army lines, and therefore down stream, the water supply became at once a difficult question, but the Sirdar kindly lent me a large whaler and a regular permanent boat party was told off. Large empty beer barrels were utilised, and this boat went across the river three times a day and filled up with water from the other side, where it had not become contaminated, and, for the Nile, was fairly clean; it was then carried up to the barracks, boiled, and passed through zeers when cool.

After a short time I found that, although the hut accommodation was excellent as a hospital for ordinary cases, yet it would not do at all should any serious cases occur, nor was there any accommodation whatever for sick officers, should it be necessary to admit them into hospital, and this applied equally to the British officers of the Egyptian Army. I therefore asked the Sirdar if he would hand over to me a large house admirably situated on the banks of the river and well adapted for forming an officers' hospital. This gave me ample accommodation for six sick officers and six men, there being four large rooms, a fine verandah, and plenty of space and out-houses. The Principal Medical Officer, Headquarters, Cairo, sent me sufficient equipment to furnish and equip six beds for officers. The Sirdar gave me the house on condition that I would take charge of any sick British officers of the Egyptian Army whom it might be necessary to send down from the front, and, as a matter of fact, from the day it was opened, it was never without one or two. Only one officer of the British troops was admitted during the summer, and, as regards the men, I cannot conceive how I should have got on without it. All the cases of enteric and all the serious cases were treated there, and the men's wards were practically full all the summer. I may add that afterwards the Principal Medical Officer of the Egyptian Army also sent up equipment for six beds.

Although the heat during April, May, and June was excessive, the health of the troops kept good to a remarkable degree, but by the end of June the long-continued severe heat began to tell, and many of the men began to show symptoms of debility, and one or two cases of enteric occurred.

Cholera.

On the evening of the 30th June a case of cholera occurred in a native at Wady Halfa, and next morning three cases occurred amongst the men of the Egyptian troops. I immediately wired to the Sirdar recommending that the whole British force should move out into camp at Gemai, an excellent camping ground about 19 miles to the south of Wady Halfa. Arrangements were at once made for the move to take place next day; it was decided that tentage, stores, baggage, &c. were to be sent by rail, but owing to lack of railway transport, the troops were to march.

From 4 a.m. on the 2nd July the troops were kept hard at fatigue work loading up the trains, and did not finish until 2 p.m. Most unfortunately the heat that day was terrific, a hot south wind was blowing, and the temperature was 116° F. in the shade, naturally the men suffered most terribly from thirst, and as going backwards and forwards from their own lines to the railway station carrying stores they had to pass through the native lines, which must have already become infected with cholera, they drank indiscriminately out of every zeer they passed, and from the river bank; in fact, the Egyptian soldiers were compassionately giving them water from their own supply. Here, undoubtedly, was where they contracted the disease.

At 6 p.m. the troops marched out of Wady Halfa, leaving behind a small detachment who had to stay for a few days as a guard over, and to assist in, the removal of stores belonging to the Ordnance Store Corps and Army Service Corps, which had been unable to be sent owing to lack of transport. Of this detachment six men died before it left Wady Halfa on the 8th July. The troops arrived at Gemai at 6 a.m. on the morning of the 3rd July, after a long and arduous march for men who had become debilitated by the great heat. I proceeded to Gemai with the force, leaving Surgeon-Captain H. Carr at Wady Halfa. Before leaving that station I carefully inspected the whole force and weeded out all sick and debilitated men whom I considered unfit to proceed further south. Arrangements were then made that these, with the whole of the sick in hospital who were fit to travel, a total all told of 45, should proceed as soon as possible to Cairo. Surgeon-Captain H. Carr was ordered to proceed with the convoy, he himself having become much debilitated from the climate. This convoy with 2 sick officers left Wady Halfa on 7th July. Surgeon-Captain Holmes arrived back on the 6th July, he having gone down to Cairo in charge of some sick officers about 3 weeks previously. On the evening of the 7th Surgeon-Captain Holmes and the detachment of the British troops, who had been left behind at Wady Halfa, left that station and came out to Gemai. I placed them in a separate quarantine camp about a mile north of the main body of the force, so on the evening of July 7th Wady Halfa was entirely evacuated by British troops.

The first cases of cholera amongst the British troops occurred both at Gemai and Halfa on the 4th instant, and between the 4th and 7th there were 6 cases at Wady Halfa, all of an intensely severe character, and all proving fatal. The most strenuous precautions were taken to guard against the spread of the disease, and cases of even mild diarrhœa were admitted into hospital and isolated; sentries were put round the camp to prevent natives from entering or selling milk (by this time cholera was raging in all the villages round); all water was carefully boiled, and every means possible taken to stamp out the disease. Altogether there were 18 cases at Gemai, and 15 deaths, *i.e.*, 16 cases, and 13 deaths at the South Camp, and 2 cases and 2 deaths at the North Camp, where the small detachment which arrived afterwards from Wady Halfa was placed. The total number of cases, including the 6 fatal cases at Wady Halfa, was 24, and there were only 3 recoveries. The peculiar characteristic of the disease seemed to be its extreme deadliness. Although many cases recovered from the collapsed condition, they appeared unable to recover strength, and simply sank and died from sheer weakness. "Cramp" was rare, only 3 or 4 cases out of the 16 I attended (and the 2 I saw at the North Camp with Surgeon-Captain C. J. Holmes, who was there in charge) had any symptoms of cramp. Once the disease got fairly started no drugs had the faintest action whatever; but I believe that many cases of mild diarrhœa which occurred and which might have gone on to cholera yielded to large doses of opium and sulphuric acid. These from my own practical experience I found really the only drugs which appeared to be of any use, and that only if given at a very early stage of the disease. I certainly believe that a large number of the cases which I returned as simple diarrhœa (and which apparently were only simple diarrhœa, but which were treated with the same precautions as if they had been cholera) would have rapidly developed into cholera if left alone, and if the stools of these could have been examined microscopically they would have been found to be swarming with the cholera bacillus. The last case of cholera occurred on 24th July; throughout this month and August the intense heat told greatly on the health of the men, and there were many cases of enteric, the disease appearing to be of an increasingly severe type, probably from the increasing debility of the men attacked. On the 24th August orders were received that the British troops were to proceed south immediately to take part in the final advance on Dongola. I at once made a careful inspection of the whole force, and a large number of doubtful and weakly men were selected to proceed to Cairo; these with the sick in hospital making a total of 83 non-commissioned officers and men left Gemai on August 27th, and proceeded to Cairo by sick convoy under the charge of Surgeon-Captain J. W. Jennings. Several men who were unfit to travel were sent into the officers' hospital at Wady Halfa, and remained there until the British troops returned from Dongola *en route* for Cairo, under care of Surgeon-Major W. Dugdale, attached Egyptian Army, until Surgeon-Captain J. W. Jennings returned from Cairo.

On August 29th about 600 of the North Staffordshire Regiment proceeded to Sarras to repair the damage done to the railway by the great storms. On September 8th and 9th Gemai and Sarras were evacuated, and the whole force proceeded to Kosheh; here a large detachment, about 150 men, was left behind, as the Sirdar found it impossible to take on the whole force owing to insufficient transport by steamer. A hospital equipped for 10 beds was opened at Kosheh, and ample equipment was left in case it was found necessary to open more beds in case of sick or wounded being sent down from the front. Surgeon-Captain A. Y. Reily remained at Kosheh in medical charge with a detachment of Medical Staff Corps.

The main body of the British troops finally left Kosheh in gunboats and towing-barges on the 12th September. Between the 12th and 28th, on which date they returned to Kosheh, there were four deaths, *i.e.*, two from enteric fever, one from drowning, and one from heat apoplexy at the action of Hafir on 19th September. A post boat, the "Kaibar," was used as a hospital ship, and all sick were sent on board her; she answered the purpose admirably, and the accommodation was ample.

Speaking generally, I may say that the health of the troops from the time they left Cairo, on March 22nd, until their return on October 13th, was remarkably good, considering the exceptionally trying summer, as regards heat and dampness, and the fatigues and privations of the last month, which were excessive. If it had not been for the unfortunate outbreak of cholera the death rate would have been extremely small compared with the experience of British troops spending the summer in the Soudan in former years.

There were 47 deaths altogether, *i.e.*, from cholera 21, enteric fever 20, dysentery 1, pneumonia 1, heat apoplexy 1, and 3 accidental deaths from drowning; or by corps, the 1st Battalion North Staffordshire Regiment lost 42, *i.e.*, by cholera 18, enteric fever 18, dysentery 1, pneumonia 1, heat apoplexy 1, and 3 drowned; the Medical Staff Corps lost 2, *i.e.*, 1 from cholera and 1 from enteric fever; the Royal Engineers lost 1 from enteric fever; the Army Service Corps and Army Pay Corps 1 each from cholera.

From the table which accompanies this report, it will be seen that 33 officers of the British troops were admitted during the campaign. None of their diseases were of a serious character except one case of enteric fever, that of Lieutenant Hutchison, North Staffordshire Regiment, who was invalided down to Cairo on 18th June 1896, and who made a favourable recovery.

There were 561 admissions, all told, for the non-commissioned officers and men. Of these 144 were cases of simple continued fever. This appeared to be frequently brought on by exposure to sun; the symptoms in nearly all the cases were much the same, though, of course, they varied in intensity—the patient being admitted with severe headache, pains all over the body, and a high temperature running from 102° to 105° F. Occasionally there were diarrhœa and vomiting. After a few days the temperature gradually fell, and in a week the patient was well, though in some cases the temperature kept high for a longer period. The tongue was white and creamy. Rest in bed, diaphoretics, and cold sponging, if temperature was high, was found the best treatment, and a brisk purge if the bowels were confined. Quinine in moderate doses for a few days seemed to have a good effect. The cases of enteric fever were all of a very severe type. Rash appeared to be more commonly present than is usual in Lower Egypt. In the few post-mortems on these cases which I was able to make the intestines were found intensely ulcerated, and this I noticed in several post-mortems I saw made on native soldiers of the Egyptian Army who died of enteric at Wady Halfa whilst I was there. In treating these cases in tents, after the move to Gemai, there was extreme difficulty in preventing sand and dust from blowing into the patients' mouths. When a daily and perpetual dust storm is blowing the treatment of this kind of case becomes a matter of great difficulty, and they have but little chance, especially where the intestines are much affected. The disease appeared to be of a progressively severe type; I mean towards the end of the campaign they were more rapid and fatal, undoubtedly from the constitution having become debilitated by the long stay in such a trying climate. Every means was taken to try and find out the origin of this disease, but when one realises that enteric fever is always present everywhere throughout the Soudan, and that the natives themselves suffer from it and die, I believe, to an even greater extent than Europeans, and how horribly they foul their water supply, it is not to be wondered at that enteric is so common and fatal a disease amongst British troops. When I was going up to Wady Halfa I met at Assouan an English civilian medical practitioner who goes there every winter; this gentleman gravely assured me that no case of enteric had ever occurred either at Assouan or further south; that it was an absolutely unknown disease in the Soudan!

Dysentery.

There were nine cases of dysentery, several of a severe and obstinate character; one of them proved fatal.

Venereal Diseases.

Of venereal diseases there were 75 admissions altogether.

On first arriving at Wady Halfa there was some trouble found in checking clandestine prostitution; there were a large number of native women, wives of the soldiers of the Egyptian army, who had gone south, who were living just outside the English lines; these used to come up to the walls of the fort after dark, and it was from these women that the men contracted disease. There was a licensed brothel under supervision in the native town of Wady Halfa, and the women here were periodically examined; very few cases of disease were contracted there. Stringent police precautions were taken, and a military patrol was placed outside the camp to prevent women from coming near, and this answered so effectively that after a few weeks the nuisance was almost stopped, and there were hardly any admissions afterwards for venereal.

Other Diseases.

Of the other diseases but few call for notice. There were 20 admissions for conjunctivitis, all, except three or four, of a very mild type, and rapidly yielding to treatment. There were four cases of pneumonia, one proved fatal; it was a case of an old soldier who had been drinking heavily for months. The cases of sore throat were simple ones, and I attributed them to men sleeping out of doors with their mouths open and thus catching cold.

Diarrhœa.

Diarrhœa gave 110 admissions; nearly all occurred during the months of July, August, and September, and, as I have previously stated in my remarks on cholera, I believe a number of these cases during the cholera epidemic would, if the stools could have been examined microscopically, have been found to contain cholera microbes.

Several cases of poisoned wounds from bites of the large tarantula spider ("Aboo Sheffa," native name) occurred; some of them gave trouble for several days.

Of the 18 admissions for wounds these were nearly all cut feet, caused by broken pieces of glass when bathing in the river.

Medical and surgical equipment, &c.

In my special report on medical and surgical equipment I have already dwelt on several points, but there are some others I would mention. During the journey by rail from Cairo to Ballianeh on March 22nd, the troops suffered a good deal from thirst (they were 22 hours in the train) as the weather was excessively hot; arrangements should be made for a large body of troops proceeding by train like this that they should have a certain proportion of buckets with spouts or lips to fill their water bottles; also, if possible, a fair supply of water. The train I travelled by left Cairo at 5 p.m., by 10 p.m. not a man had a drop of water left. During the journey they had the greatest difficulty in filling their bottles, for at the small stations there was frequently only one bucket, and this having no spout, spilt and wasted the water, and it took nearly one bucket to fill two water bottles; the waste of water and of time was great.

Water bottles in use by the troops are far too small for campaigning in a hot climate, they hold about 30 ozs. only; those in use by the Egyptian Army are far better. They are the same pattern, but double the size and hold 3 pints, The bottles answered excellently as far as keeping the water cool went, but they did not hold enough.

Rations.

The quality of the rations was very good all through, but the issue of meat was far too great; 1¼ lbs. daily was the ration and the waste of meat was stupendous, large quantities being buried every day. Neither was any use whatever made of the bones which could have been utilized for soup; ¾ lb. of fresh meat, or ½ lb. preserved in a hot climate like the Soudan would be ample, and this could be supplemented with more vegetables, or cheese and bacon. Potatoes failed directly we left Wady Halfa, and after that only onions and beans were issued; these were of good quality.

The jam ration was most excellent, and should be issued in larger quantities.

The bread was on the whole very fair, and the biscuits were excellent.

Lime-juice was issued four times a week, and was of good quaility, and of great value; I would, however, suggest a daily ration.

Rum was only twice issued, and each time greatly appreciated.

A proportion of mincing machines served out not only to the hospitals, but to regiments, would be of the utmost value.

The scale of rations for each officer and soldier was:—

Meat.—1¼ lbs. fresh, or 1 lb. preserved.

2 ozs. cheese, when available, may be drawn in lieu of 4 ozs. fresh meat, or 3 ozs. preserved meat.

Bacon, 4 ozs. in lieu of 4 ozs. fresh or preserved meat (when available).

Bread Stuffs.—1¼ lbs. bread, or 1 lb. of biscuit, or 1 lb. of flour.

Groceries.—Two-thirds oz. tea, or two-thirds oz. coffee, or half the ration of each; 2¼ ozs. sugar, ½ oz. salt, $\frac{1}{36}$th oz. pepper, ½ oz. rice.

Rations of groceries will be issued at an hour which will enable troops marching during the night, or early morning, or who are under arms before daybreak, to have a cup of tea or coffee before starting, and to carry ½ lb. bread or biscuit in their haversacks.

Lime-Juice Ration.—$\frac{1}{320}$th of a gallon of lime-juice and ¼ oz. sugar when the Medical Officer considers the issue necessary, and it is available.

Vegetables.—1 lb. of fresh vegetables, or 1 oz. of preserved vegetables, only to be supplied when troops are considered to be on field service.

Spirits.—$\frac{1}{64}$th of a gallon of rum (if available). Will not be issued without the sanction, in every case, of the G.O.C. under very exceptional circumstances.

Jams.—¼ of a one-pound tin (about 4 ozs.) of jam or marmalade, when available.

Fuel.—1 lb. of coal, or 2 lbs. of wood, to be the maximum quantity issued daily in camp, to be reduced to 1 lb. of wood on the march, and then only when not obtainable by the troops themselves.

Dried dung is a good substitute for fuel when wood or coal is not obtainable.

Light.—Hospitals, as required. Guards, horse picquets, officers, and offices, one candle per night for each.

One candle per night for every 12 soldiers in huts or standing camp only.

When oil is issued, 1 gill will be considered as a substitute for each candle.

The ration for native followers was—

Bread, biscuit, or flour - - -	1 lb.
Meat, fresh or preserved - - -	½ „
Coffee - - - - -	⅓ oz.
Sugar - - - - -	2 „
Salt - - - - -	½ „

Clothing.

Spine protectors were used throughout the Campaign. I consider these articles most useful when men are working in the sun, their dress being simply flannel shirts and trowsers, with a spine protector; this is a cool, good working dress, and the men liked them, which, I think, is a practical point in their favour.

The ordinary white service helmets covered with khaki worn by the men were terribly heavy, A large number of grey topees were served out by the Ordnance Department for use of special working parties, and these were really excellent; they were light, comfortable, and offered a perfect protection to the sun. I personally had one throughout the whole campaign.

Helmet curtains were issued and worn; there was a good deal of difference of opinion as to their utility or not, some liking them, some not; for working parties in the heat of the sun, if there is no wind I certainly think they protect the nape of the neck, but they keep off wind and air.

Putties were worn, and certainly the majority of the men liked them, and they look smarter and keep the dust from getting inside the boots, and they might be of service as a tourniquet or bandage in case a man was wounded. For mounted troops, of course, they are invaluable, but for infantry I fail to see that they have any particular advantage or disadvantage, except that they must make their legs hotter. Personally I would rather march without them, yet I am bound to admit that by far a larger proportion both of officers and men prefer wearing them to not doing so, so that they must be practically of benefit.

Khaki drill of course was universally worn as clothing, and answered well.

The brown canvas shoes issued by the Ordnance Department were excellent both as regards usefulness and comfort.

Medical comforts.

The medical comforts were of good quality; before I started I insisted that the best brand of champagne procurable in Cairo should be taken (Perrier and Jouêt's).

The brandy was of fair quality but the bottles should be better corked, and sealed and capsuled in the hot weather; the expansion of the spirit forced the corks half out of the bottles. A stock of Brand's essence of beef and condensed soups should be added. Cocoa (Van Houten's) and chocolate would be an excellent addition as well. The Swiss milk ("Milk Maid" brand) supplied turned a deep brown colour from the heat, but this did not appear to affect in any way either the quality or taste.

Medicines.

In my special report on medical and surgical equipment I have pointed out the great value of "tabloids" being used, both as regards utility and portability. Chloroform should be in one ounce bottles; this is a point of great practical utility and economy. A bottle once opened becomes useless. All pills should be coated; in the heat they all melt and stick together.

Surgical equipment.

Canteen "D": this pannier should hold double the number of bed pans and urinals; canvas ice bags should be used instead of indiarubber. All articles made of indiarubber should be done away with as much as possible; this material rapidly becomes useless and cracked, and so do all articles of leather.

Thin pyjama suits should be supplied for patients; the blue clothing is too hot.

Cooking utensils.

The cooking utensils were good; the Rippingille's stoves answered excellently.

Lanterns.

The folding lanterns were useless, they were easily broken, and the top came off directly the candle was lit, the soldering becoming melted.

Bedding.

A bed somewhat of the pattern of the operating table bed would be better than those in three pieces; it would be more comfortable and more portable.

Tent

No more tentage should be taken than is absolutely necessary on account of the difficulty of transport.

Enamelled filters, Mark I., were useless; they are not suitable for so hot a climate. The field hospital filters answered well, but they are troublesome and require too large a quantity of charcoal to be really useful except for stationary hospitals. The native zeer is an excellent means of clearing water in removing the mud and also for cooling purposes. Care must be taken not to put hot water into them, however; a large number were broken and spoilt in this way. Unless a very large number of Pasteur filters could be taken—and this, on account of the expense and difficulty of transport, could, I fear, never be done with an army on the move—really none of the ordinary filters in use are of any real benefit except as a measure for clearing water. All water as far as possible should be boiled; if it was possible always to do this and to make the men drink it, which by the way they most strongly object to doing, an immense amount of sickness would be avoided. In theory, to do this would seem an easy matter; in practice it is very difficult, and, excepting just for a few weeks when the cholera epidemic was at its height, and the men were thoroughly frightened, I found from my own experience, that neither officers nor men would ever use boiled water if they could possibly avoid it.

Transport.

The transport of the British sick was entirely done by water and rail. Before the advance to the South I had arranged with the Chief Staff Officer and Principal Medical Officer, Egyptian Army, that should there be any casualties of British troops in action, as much transport as I required during the action would be provided by the Principal Medical Officer Egyptian Army, and under instructions from the Chief of Staff I took no transport equipment further south than Halfa.

RETURN showing the STRENGTH, ADMISSIONS INTO HOSPITAL, and DEATHS among the BRITISH TROOPS, DONGOLA EXPEDITIONARY FORCE, from 23rd March to 13th October 1896, with rates per cent. per annum.

Average Annual Strength	Officers, 32.				W. and N.C. Officers and Men, 575.			
			Rate per cent.				Rate per cent.	
Diseases.	Admissions into Hospital.	Deaths.	Admissions.	Deaths.	Admissions into Hospital.	Deaths.	Admissions.	Deaths.
I.—GENERAL DISEASES.								
GROUP "A."								
Sub-Group I. Small-pox	—	—	—	—	—	—	—	—
Sub-Group I. Other Eruptive Fevers	—	—	—	—	—	—	—	—
Sub-Group I. Enteric Fever	1	—	3·1	—	40	20	7·0	3·48
Sub-Group I. Other Continued Fevers	17	—	53·1	—	144	—	25·0	—
Sub-Group I. Cholera	—	—	—	—	24	21	4·2	3·65
Sub-Group I. Dysentery	—	—	—	—	9	1	1·5	·17
Sub-Group I. Other Diseases	—	—	—	—	—	—	—	—
Total	18	—	56·2	—	217	42	37·7	7·30
Sub-Group II.—Malarial Fevers	—	—	—	—	1	—	·2	—
Sub-Group III.—Septic Diseases	—	—	—	—	—	—	—	—
Sub-Group IV. Syphilis, Primary	—	—	—	—	6	—	1·0	—
Sub-Group IV. " Secondary	—	—	—	—	5	—	·9	—
Sub-Group IV. Gonorrhœa	—	—	—	—	25	—	4·4	—
Total	—	—	—	—	36	—	6·3	—
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—	—
GROUP "B."								
Sub-Group I.—Parasitic Diseases	—	—	—	—	1	—	·2	—
Sub-Group II. Scurvy	—	—	—	—	—	—	—	—
Sub-Group II. Alcoholism	—	—	—	—	—	—	—	—
GROUP "C."								
Debility, &c.	—	—	—	—	7	—	1·2	—
GROUP "D."								
Rheumatism	1	—	3·1	—	11	—	1·9	—
Tubercular Diseases	—	—	—	—	—	—	—	—
Other Diseases	—	—	—	—	—	—	—	—
II.—LOCAL DISEASES.								
Diseases of the—								
1. Nervous System { Nervous Diseases	—	—	—	—	—	—	—	—
1. Nervous System { Mental "	—	—	—	—	—	—	—	—
2. Eye	1	—	3·1	—	21	—	3·7	—
3 & 4. Other Organs of Special Sense	—	—	—	—	3	—	·5	—
5. Circulatory System	—	—	—	—	—	—	—	—
6. Respiratory "	—	—	—	—	6	1	1·0	·17
7. Digestive "	7	—	21·9	—	140	—	24·4	—
8. Lymphatic and Glandular System	—	—	—	—	2	—	·4	—
9. Urinary System	—	—	—	—	—	—	—	—
10. Generative "	—	—	—	—	41	—	7·1	—
11. Organs of Locomotion	—	—	—	—	1	—	·2	—
12. Connective Tissue	1	—	3·1	—	6	—	1·0	—
13. Skin	1	—	3·1	—	20	—	3·5	—
III.—POISONS.	—	—	—	—	7	—	1·2	—
IV.—INJURIES.								
1. General	—	—	—	—	6	4	1·0	·70
2. Local	4	—	12·5	—	30	—	5·2	—
3. In Action	—	—	—	—	—	—	—	—
No appreciable disease	—	—	—	—	5	—	·9	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—
General Total	33	—	103·1	—	561	47	97·6	8·17

RECORD of the MAXIMUM and MINIMUM SHADE TEMPERATURE (Fahrenheit) taken at 2.30 p.m. and about 5 a.m. daily at the several Stations occupied by the EXPEDITIONARY FORCE.

Day of Month.	Wady Halfa.						Gemai.						Kosheh.	
	April.		May.		June.		July.		August.		September.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	—	—	112	84	116	84	*116	*78	109	92	101	89	—	—
2	92	72	110	85	116	85	117	81	110	93	103	91	—	—
3	93	74	102	76	117	91	116	78	111	89	106	90	—	—
4	92	73	103	77	113	94	114	78	109	87	102	92	—	—
5	94	77	96	76	108	90	111	77	107	85	100	91	—	—
6	90	76	95	75	101	89	112	79	109	86	100	91	—	—
7	91	77	105	75	105	85	109	78	104	83	102	92	—	—
8	91	76	95	74	111	84	108	81	106	85	—	—	104	90
9	92	78	103	76	110	83	104	79	102	—	—	—	103	89
10	94	72	111	77	108	81	100	78	105	89	—	—	—	90
11	94	73	112	76	103	78	100	78	108	94	—	—	—	—
12	95	75	111	79	107	80	102	79	112	97	—	—	—	—
13	—	77	113	80	111	82	101	77	115	97	—	—	—	—
14	98	76	111	80	116	84	102	77	106	96	—	—	—	—
15	103	78	110	80	114	84	103	76	109	97	—	—	—	—
16	102	79	106	77	106	75	106	76	107	95	—	—	—	—
17	101	80	105	72	102	78	107	77	105	93	—	—	—	—
18	102	79	103	79	106	78	110	78	107	89	—	—	—	—
19	101	78	109	83	105	79	109	78	102	89	—	—	—	—
20	99	77	112	84	105	81	106	79	103	88	—	—	—	—
21	98	72	114	82	106	82	106	80	106	91	—	—	—	—
22	101	76	113	84	113	87	113	81	110	93	—	—	—	—
23	100	77	116	85	107	83	110	84	106	95	—	—	—	—
24	101	78	109	84	101	77	109	82	116	95	—	—	—	—
25	102	—	110	82	101	72	113	81	117	96	—	—	—	—
26	107	81	108	82	100	74	111	82	114	97	—	—	—	—
27	106	85	114	84	99	74	109	84	110	99	—	—	—	—
28	109	—	104	83	102	74	108	85	113	98	—	—	—	—
29	112	84	103	82	110	78	110	87	104	94	—	—	—	—
30	115	84	108	79	112	76	112	87	101	95	—	—	—	—
31	—	—	111	83	—	—	112	91	99	93	—	—	—	—

* Wady Halfa.

APPENDIX No. V.

REPORT ON THE MEDICAL TRANSACTIONS OF THE BECHUANALAND, MATABELELAND, AND MASHONALAND FIELD FORCES DURING THE PERIOD FROM 8TH MAY 1896 TO 3RD JANUARY 1897.

I.—The Bechuanaland and Matabeleland Field Forces.

By Surgeon Lieutenant-Colonel J. A. Gormley, M.D., Army Medical Staff, late Senior Medical Officer, Imperial Contingent.

Early in April orders were received by the General Officer Commanding in Natal to prepare and despatch a force of British troops to co-operate with the forces of the British South Africa Company in suppressing the revolt of the natives in Matabeleland. The following troops were placed under orders and directed to hold themselves in readiness to embark at Durban as soon as a ship could be procured and suitably fitted for the conveyance of men and horses, viz., three squadrons 7th Hussars, 100 mounted infantry from the West Riding Regiment, and a detachment of Royal Artillery, about 45 strong, with two mountain guns.

This force was to be strengthened on arrival at Mafeking by the addition of 100 mounted infantry of the York and Lancaster Regiment from Cape Town.

The following officers and men of the Army Medical Staff and Medical Staff Corps were ordered to accompany the force, viz.:—Surgeon Lieut.-Colonel J. A. Gormley, Surgeon-Captain S. Hickson, Surgeon-Captain N. C. Ferguson, 1 warrant officer, 1 sergeant, and 8 privates, Medical Staff Corps, from Natal; 1 sergeant, 2 corporals, and 7 privates from Cape Town; total, 3 officers, 1 warrant officer, 4 non-commissioned officers, and 15 privates.

The following equipment was ordered to be taken:—1 field hospital, complete, with the exception of ambulance and general service waggons, also the equipment of half a bearer company, without waggons, the personnel of which was to be arranged for as circumstances would allow.

The Union steamship "Goth" was chartered and fitted for the accommodation of the men and horses. The troops left Maritzburg on the 1st May, part proceeding by march route, and the remainder by rail to Durban. The embarkation of the horses and stores occupied a day and a half, and the ship sailed on the afternoon of the 3rd, and arrived off East London on the following morning, when the disembarkation, by means of lighters, was at once begun. This operation, owing to the heavy swell usually experienced at East London, took two and a half days, but was accomplished without accident to man or horse.

The journey by rail from East London to Mafeking occupied three days. The arrangements for feeding the troops along the route were made by the Chartered Company, and were very good, two substantial hot meals being provided daily in addition to coffee and biscuits.

On arrival at Mafeking the troops were placed under canvas to await further orders.

As it soon became apparent that no advance would be made for some time, it became necessary to open a section of the field hospital for the treatment of any cases that might occur, and this was accordingly done. This section remained open to the end of the campaign, forming a base from which supplies were forwarded to the front as required. When all the troops forming the force had arrived at Mafeking the strength was 37 officers, 665 warrant officers, non-commissioned officers and men, all being mounted. They were known as the Imperial Contingent, Matabele Relief Force, and were under the immediate command of Lieut.-Colonel Paget, 7th Hussars.

The ground on which the camp was pitched was a large, rather dusty plain, close to the town. It had on previous occasions been used for the same purpose, and it was here the Bechuanaland Field Force, under Sir Charles Warren, was located for some months, and subsequently the Inniskilling Dragoons and the Bechuanaland Mounted Police. The latter had at one time its headquarters here, and still has some men who are in permanent barracks. For their use, water from the town waterworks was laid on, and this came in useful for the troops, a sufficient supply of good drinking water being thus available. A river running just below the camp supplied water for the horses and for washing purposes. The necessary precautions for keeping the camp in a good sanitary condition were taken, each corps being responsible for the cleanliness of its own lines, and, in addition, the camp quartermaster had some men at his disposal who exercised a general supervision over the whole.

The health of the men while at Mafeking was on the whole very good. A few cases of enteric fever occurred, due probably to drinking polluted water from the river or elsewhere. Fresh milk was scarce, so was not a likely source of infection. The temperature during the days in the months of May, June, and July was pleasantly warm, but the nights were very cold. Each man was supplied with two blankets and a waterproof sheet, and although some of them complained of feeling cold at night their health in no way suffered, and not a single case of pneumonia or bronchitis occurred.

The rations issued by the British South Africa Company were good and on a very liberal scale. Each man was given 1½ lbs. of meat daily, which was more than the majority of them could eat, and vegetables, tea, coffee, and sugar were also issued in liberal quantities.

It was not until the 20th June that definite orders for the troops to move forward were received. Two hundred men, half being cavalry and half mounted infantry, were directed to advance, their destination being, in the first place, Macloutsi, a former station of the Bechuanaland Police, distant about 400 miles from Mafeking and 200 from Buluwayo.

In arranging for the advance two serious obstacles had to be overcome—one was the difficulty of procuring the required amount of transport, and the other the question of a sufficient supply of water for the men and animals along the route. The former was by far the more serious one; the distance to be traversed was very great, the roads were very bad, the rinderpest had destroyed all the trek oxen, which had up to then been almost the sole means of transport, so that mules alone were now available, and these were difficult to obtain in sufficient numbers. A very large number was necessary, for not only had considerable supplies for the men and their horses to be carried, but also grain for the mules themselves. This transport difficulty had, therefore, to be seriously considered, and was so pressing that it became a question of what could possibly be dispensed with. Strict orders were given that only such things as were absolutely necessary should be taken, and, in consequence, careful selection had to be made of such articles of the field hospital equipment as were really indispensable; no tents were allowed for the men, and a small number only for hospital use.

The second important matter which had to be considered was the water supply along the route. This was reported bad, the quantity insufficient, and the quality in many places doubtful. To overcome this difficulty, the troops were ordered to march in detachments of 50 men at a time, one detachment being a day in advance of the one following it, and in this way the first 200 men started. The medical arrangements had to be made accordingly, and the following was the plan adopted:—Surgeon-Captain Hickson was directed to proceed in charge of the 200 men, and to accompany the last detachment; a non-commissioned officer or orderly of the Medical Staff Corps to go with each of the three previous detachments. The medical officer took with him a section of the field hospital, and with each non-commissioned officer or orderly I sent a supply of such medicines and surgical dressings as I thought might be required for the treatment of men falling sick on the road; also a small supply of medical comforts and some extra blankets.

I carefully selected the men of the Medical Staff Corps sent in charge of the detachments, and personally ascertained that they were acquainted with the symptoms and treatment of such diseases as were most likely to occur. Instructions were also given to each that in the event of a man becoming seriously ill he was to halt with him at the first available place to wait the arrival of the medical officer, who would assume charge of him and carry him along in the ambulance. It was for this reason that the medical officer was to be with the last detachment.

The men started in the order above stated, the first detachment leaving on the 22nd, and the last on the 25th June. The officer commanding each detachment was given written instructions for his guidance as to what to do for the preservation of the health of his men, particular stress being laid on the necessity of preventing, as far as possible, the men from drinking any except boiled water, and it was recommended that cold weak tea should be carried in the water bottles instead of water. These instructions were, I believe, generally speaking, attended to, and with very good results.

Orders being received for a second 200 men to proceed to the front, the same order was observed in their advance, and exactly the same medical arrangements were made as in the previous instance. Surgeon-Captain Ferguson was directed to proceed in charge, and to take with him a section of the field hospital and a sufficient supply of medical comforts to last for some time. On the departure of Surgeon-Captain Ferguson I applied for another medical officer, and in response to my application Surgeon-Captain Skerritt was ordered to Mafeking. On his arrival he was directed to assume charge of the troops remaining at Mafeking, and I, in compliance with orders already received, went by coach to Macloutsi, where I arrived on the 25th July. I found when I reached there that the first 200 who had left Mafeking had already arrived, and had gone on to Victoria. The first detachment of the second 200 had also arrived, and were under orders to proceed at once towards Buluwayo. This detachment was followed by the others as they came in.

The distance from Mafeking to Macloutsi, something over 400 miles, was done in 24 days; the men on their arrival were in excellent health, and appeared not to have suffered in the least from sleeping in the open without tents. Out of the 400 men there was not a single case of serious illness, and, with the exception of cases of diarrhœa, they required no treatment of any kind.

From Macloutsi one of the divisions of 200 men under the command of Lieut.-Colonel Paget, 7th Hussars, marched into the Victoria District, where they remained for the greater part of the time operating in various directions; the other, under Major Ridley, 7th Hussars, proceeded towards Buluwayo. Surgeon-Captain Hickson was in charge of Colonel Paget's column, and Surgeon-Captain Ferguson that of Major Ridley's. I also accompanied Major Ridley's column to Buluwayo, and on my arrival there on the 11th August reported myself to the Major-General commanding the expedition. Soon afterwards, by an order from His Excellency the High Commissioner, I was appointed to Sir Frederick Carrington's personal staff, and remained with him to the end of the expedition. On the 10th August a force of Imperial troops, 150 strong, proceeded up the River Guai in search of a body of the rebels reported in that district. Surgeon Redpath, of the Red Cross Society, with an ambulance and medical stores, accompanied them. They returned in 10 days, having come up with only a small force which, after having fired some shots, retired into the bush. There were no casualties on our side.

On the 20th August orders were received for the Imperial contingent, 200 strong, to be reinforced by a body of irregulars about 170 strong, with one seven-pounder and two Maxims, and to hold themselves in readiness to advance towards the Shangani river to attack the enemy, who was reported to be in force in that neighbourhood. I arranged to accompany this force myself, and directed Surgeon-Captain Ferguson to proceed also, and take with him the section of the field hospital and such stores as were likely to be required. Six bell tents were taken as part of the field hospital and two ambulance waggons, one of which was large and roomy, and the other smaller and lighter. The column left on the morning of the 27th for the Shangani, viâ Imyati. One man only, a Hussar, was unable to start; he was suffering from fever and was sent to the Buluwayo hospital; all the remainder were in excellent health. The feeding of the troops was a matter of great difficulty, as, owing to the rinderpest, it was almost impossible to procure fresh meat. Since leaving Mafeking the men had very little fresh meat of any kind, and fresh vegetables were unprocurable. I made strong representations on the matter, and pointed out the danger there was of scurvy breaking out. All the suggestions I made to prevent the possibility of this occurring were acted on as far as it was possible. A number of cattle were procured and driven along with the troops, but unfortunately the rinderpest destroyed most of these, so that fresh meat could be only issued for a few days after the expedition started.

With regard to the dieting of the troops I had to consider in my recommendations the best means of counteracting the injurious effects that might follow on the prolonged absence of fresh meat and vegetables, and I, therefore, selected as a guide, and followed as nearly as possible, the scale of extras issued to the troops during the Nile expedition, viz. :—

Article.	Proposed daily Issue per Man.
Preserved corn beef - -	1 lb., four days out of six.
Fresh meat - - - -	1 lb., one day out of six.
Bacon - - - - -	1 lb., one day out of six.
Cheese - - - - -	$\frac{3}{4}$ oz., one day out of six.
Biscuits, Navy - - -	1 lb., five days out of six.
Flour - - - - -	1 lb , one day out of six.
Pickles - - - - -	$\frac{1}{2}$ oz., four days out of six.
Jam or marmalade - - -	$1\frac{1}{2}$ oz., two days out of six.
Tea - - - - -	1 oz.
Sugar - - - - -	3 oz.
Preserved vegetables - -	1 oz.
Lime-juice - - - -	$\frac{1}{2}$ oz.
Erbswurst - - - -	One ration every third day.
Cocoa and milk - - -	———
Vinegar - - - -	———

The modifications recommended in the above were that flour should be issued instead of biscuits, as every facility existed for cooking the former, a state of things that did not obtain in Egypt, where wood and other fuel were exceedingly scarce; cocoa and milk to be left out and replaced by condensed milk; and what is known as "Weil's Road Ration," each tin guaranteed to contain $\frac{3}{4}$ lb. of meat and $\frac{3}{4}$ lb. of vegetables, a very useful issue, say, two days out of six.

Fortunately it was found possible to procure locally many of the articles recommended, such as jams, pickles, vinegar, &c., though not in very large quantities. Lime juice was, of course, issued as freely as possible, one ounce per man on alternate days being given. I am happy to say that throughout the campaign in not a single instance did scurvy make its appearance, and on the whole the men suffered very little from their prolonged living on hard rations. In lieu of biscuits flour was issued the whole time, and this, with a little baking powder, made very palatable bread, or cookies, as the men called them. The abundance of firewood, always at hand, rendered bread-making an easy matter, and though, perhaps, at times the bread was somewhat indigestible, it was more acceptable than biscuits.

On the 2nd September the column reached the Shangani river, which at certain times of the year is very broad and deep, but was at this time merely a dry sandy bed. Sufficient water for the horses was got from some stagnant pools, while for drinking purposes it was necessary to dig wells in the sand. This is only one instance out of many to show the difficulties there were of procuring water for drinking and washing purposes.

The disease which caused the largest number of admissions and nearly all the deaths was enteric fever, and, next to that, dysentery. As is well known, both these diseases are water-borne diseases, and water is almost the sole method by which they are spread. As regards the source of pollution, there was at least one very evident cause for this, in the numerous bodies of animals which had died of rinderpest being invariably found lying near the water. Sick animals always endeavour to get to the water, where, of course, they nearly always die, so that their dead bodies are more frequently to be met with near water than elsewhere, and thus furnish a ready source of pollution with organic matter. Every precaution was taken to prevent the men drinking unboiled water, but a sufficient supply could not always be carried, and it was scarcely to be expected that men coming in after a hot dusty march would always refrain from drinking such water as was procurable. Under the circumstances, therefore, the number of cases of enteric fever and dysentery was not more than might reasonably be expected.

From the Shangani the column continued to advance north-eastward towards the Umoungu river, which was reached about the 7th October. Up to this no trace of the enemy was to be found. Patrols of various strengths were sent daily in different directions, and a number of kraals were burned. The kraals had been abandoned and everything in them taken away. On the 6th September an attack was made on some kopjes where a body of the enemy was reported to be located. Some shots were exchanged and one man of the mounted infantry was slightly wounded in the face.

On the 7th a further attack was made on some other kopjes in a different direction. On this occasion two men of the 7th Hussars were severely wounded; one was a case of lacerated wound of the upper part of right thigh, the bone and important vessels escaping, the other a wound of the right forearm and wrist. In the latter case the joint was laid open and the bones and soft parts were found so injured that amputation through the forearm three inches above the joint was necessary. In both cases the missile was some irregular-shaped body fired from a smooth bore gun at very close quarters. On the 9th some further desultory fighting took place, the only casualty on our side being one man very dangerously wounded in the face. The wound in this instance was of a very severe and distressing nature, the whole of the lower part of the face was lacerated, both cheeks were torn open, the inferior maxilla and right superior maxilla were fractured into numerous small pieces and the tongue much injured; hæmorrhage was very free and was controlled with difficulty. At the time it was impossible, owing to the extreme collapse of the patient from the shock of the injury, to remove the broken fragments of bone, and this was done some days later, when more than a dozen fragments of bone of various sizes were removed. There was great difficulty in keeping the wound aseptic and also in feeding him; he was quite unable to swallow except through a tube. He and the other sick and wounded were sent back to the civil hospital at Buluwayo, which during the war was used as the base hospital for all the Chartered Company's forces. Here with careful nursing by the sisters he made a fair recovery and was subsequently invalided to England.

Patrols continued to be sent out to various parts of the country, frequently going long distances, and being away for days at a time with only what the men could carry with them on their horses. On these occasions they had frequently to endure severe fatigue with a very short allowance of food, and on two occasions, when away from the waggons for a longer period than was anticipated, their rations were completely exhausted, and they had to resort to shooting some of the horses for food. In spite of these hardships their health remained excellent, and there was practically no sickness among them, if we leave out the comparatively few cases of enteric fever and dysentery which occurred.

From this time forward the military operations consisted of driving the enemy from one place to another, capturing grain and burning kraals. There was little opposition met with, and with the exception of one of the irregulars killed no further casualties occurred on our side. The column, on its return march to Buluwayo, reached Imyati on the 1st of October, when fresh orders were received from the General Officer Commanding directing Colonel Baden-Powell with 150 Imperial troops to march to Gwelo, join the Victoria Column under Colonel Paget, 7th Hussars, and operate together against some chiefs who were still holding out. I directed Surgeon-Captain Ferguson with a section of the Field Hospital to accompany Colonel Baden-Powell's force, while I returned with the remainder of the column to Buluwayo, and rejoined the staff of the General Officer Commanding. Colonel Baden-Powell's force in due time reached Gwelo, near which place it formed a junction with the Victoria Column—the combined forces then marched into Mashonaland, and attacked the chiefs against whom they were sent. There was little or no opposition, and no casualties occurred on our side. Several cases of enteric fever occurred, and there were three deaths from this disease. This brings us to the middle of November, by which time the active operations of the campaign were concluded, and orders were issued for all the Imperial troops to return to their respective stations, except such as were selected to remain in occupation of the country. It was at first estimated that 400 would be required, but this number was reduced to 200. The 7th Hussars was the corps selected, and orders were issued for huts to be erected for them at a site chosen by the Chief Staff Officer, and approved by me. The remainder of the Matabeleland force returned to Cape Town and Natal.

In the foregoing description of the campaign little mention is made of the Victoria Column under Colonel Paget. This is in part due to the fact that there is little that was interesting to relate, and partly that, owing to the difficulties of forwarding letters, I had little personal communication with the medical officer in charge, who reported to me as often as opportunity offered. The health of the men under his charge was on the whole very good, and with the exception of some cases of enteric fever and dysentery there was no sickness amongst them. That column, like the Buluwayo Column, was employed in patrolling various parts of the districts, but it met with less opposition than the latter, their only casualty being one man killed, a corporal of Hussars, who was shot through the head during an assault on some caves.

The extension of the rising to Mashonaland necessitated the despatch of a force of about 27 officers, 500 non-commissioned officers and men, consisting of mounted infantry, specially sent out from Aldershot, some men from the West Riding Regiment, and a detachment of Royal Artillery, with two 7-pound guns and Maxims, all under the command of Lieutenant-Colonel Alderson. This force was fitted out at Cape Town and Maritzburg, and went viâ Beira through the Portuguese territory to reach Salisbury. The Medical Staff and Medical Staff Corps sent with this force consisted of three surgeon-captains, one warrant officer, and 20 non-commissioned officers and men. Owing to the complete absence of communication, except by telegraph, which was not always possible, I was unable to exercise any supervision over the medical arrangements for the Mashonaland force. This was done by Surgeon-Captain Saw, the senior medical officer, whose report on the campaign accompanies this report. The other two medical officers who were with the force were Surgeon-Captain Hale and Surgeon-Captain Hilliard, C.M.G.

On the 3rd November I left Buluwayo with the Major-General Commanding and the remainder of his staff for Salisbury, where we arrived on the 19th idem. I then had an opportunity of inspecting the medical arrangements made for the Mashonaland force, which I found to be on the whole very satisfactory, and as good as could be under the circumstances. There were, in addition to the officers of the Army Medical Staff, a number of civilian practitioners employed with the troops.

It was not considered necessary to retain any of the Imperial troops in Mashonaland after active operations had ceased, their place being taken by the Chartered Company's permanent police. Consequently the whole force was withdrawn, and by theend of the year the last man had quitted the country, fortunately, before the very wet season had set in.

The campaign from a medical point of view may, I think, be considered to have been highly satisfactory, considering the enormous difficulties which had to be overcome. These difficulties were chiefly those of transport, and all departments were affected by them. The means for transporting sick and wounded were for the most part very imperfect and very limited; the distances to be traversed were very great, and the roads of the worst possible description. Stores could be got up in very limited quantities, and the time of their arrival could never be counted on. Tents, except a few for hospital use, there were none, so that both officers and men lived and slept entirely in the open, exposed to very considerable extremes of temperature.

The food, though as good as could be got, consisted almost entirely of tinned provisions; fresh vegetables, at least in Matabeleland, were unattainable.

Notwithstanding the above very decided hardships, the health of the men was on the whole very good, a fact which I consider to be in a great measure due to the dry and bracing nature of the climate, and to the active life the men necessarily led.

There is one form of an affection from which few, either officers or men, escaped, and that is what is known as Veldt sores, which occur chiefly on the hands. Sores follow almost any abrasion, however slight, and are very slow in healing. They are no doubt due in part to want of variety in diet, and an insufficiency of vegetable food, but there were no indications of scurvy symptoms.

Return showing the **Strength**, **Admissions** into **Hospital**, and **Deaths** among the **British Troops** on Active Service in Bechuanaland and Matabeleland from 8th May 1896 to 4th December 1896, with rates per cent. per annum.

Average Annual Strength.	Officers, 21.				W. and N.C. Officers and Men, 384.			
—	Admissions into Hospital.	Deaths.	Rate per cent.		Admissions into Hospital.	Deaths.	Rate per cent.	
			Admissions.	Deaths.			Admissions.	Deaths.
I.—GENERAL DISEASES.								
Group "A."								
Sub-Group I. Small-pox	—	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—	—
Enteric Fever	—	—	—	—	34	11	8·8	2·86
Other Continued Fevers	1	—	4·8	—	21	—	5·5	—
Cholera	—	—	—	—	—	—	—	—
Dysentry	7	1	33·3	4·76	26	—	6·8	—
Other Diseases	—	—	—	—	—	—	—	—
Total	8	1	38·1	4·76	81	11	21·1	2·86
Sub-Group II.—Malarial Fevers	1	—	4·8	—	15	—	3·9	--
Sub-Group III.—Septic Diseases	—	—	—	—	—	—	—	—
Sub-Group IV. Syphilis, Primary	—	—	—	—	4	—	1·1	—
„ Secondary	—	—	—	—	2	—	·5	—
Gonorrhœa	—	—	—	—	9	—	2·3	—
Total	—	—	—	—	15	—	3·9	—
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—	—
Group "B."								
Sub-Group I.—Parasitic Diseases	—	—	—	—	—	—	—	—
Sub-Group II. Scurvy	—	—	—	—	--	—	—	—
Alcoholism	—	—	—	—	—	—	—	—
Group "C."								
Debility, &c.	—	—	—	—	5	—	1·3	—
Group "D."								
Rheumatism	—	—	—	—	8	—	2·1	—
Tubercular Diseases	—	—	—	—	—	—	—	—
Other Diseases	—	—	—	—	—	—	—	—
II.—LOCAL DISEASES.								
Diseases of the—								
1. Nervous System Nervous Diseases	—	--	—	—	—	—	—	—
Mental „	—	—	—	—	—	—	—	—
2. Eye	—	—	—	—	5	—	1·3	—
3 & 4. Other Organs of Special Sense	—	—	—	—	—	—	—	—
5. Circulatory System	—	—	—	—	—	—	—	—
6. Respiratory „	—	—	—	—	1	—	·3	—
7. Digestive „	3	—	14·3	—	22	—	5·7	—
8. Lymphatic and Glandular System	—	—	—	—	5	—	1·3	--
9. Urinary System	—	—	—	—	—	—	—	—
10. Generative „	—	—	—	—	2	—	·5	—
11. Organs of Locomotion	—	—	—	—	2	—	·5	—
12. Connective Tissue	—	—	—	—	3	—	·8	—
13. Skin	1	—	4·8	—	18	—	4·7	—
III.—POISONS.								
IV.—INJURIES.								
1. General	—	—	—	—	—	—	—	—
2. Local	2	—	9·5	—	22	—	5·7	—
3. In Action	—	—	—	—	4	1	1·1	·26
No appreciable disease	2	—	9·5	—	—	—	—	—
Cause unknown (refers to death only)	—	—	—	—	—	—	—	—
General Total	17	1	81·0	4·76	208	12	54·2	3·12

II.—The Mashonaland Field Force.

By Surgeon-Captain F. A. Saw, M.B., Army Medical Staff.

Outlines of the Military Operations.

The Mashonaland Field Force, consisting of 12 officers and 239 non-commissioned officers and men of the Mounted Infantry, and a few details of the Royal Artillery and Medical Staff Corps, left Capetown on the "Arab" on the 26th June. The expedition was fitted out in less than a week, and was destined to assist in suppressing the rebellion in Mashonaland. Arriving at Durban on the 30th June, the remainder of the horses, stores, &c. were taken on board. On the 3rd July we reached Beira, and there the force was increased by 4 officers and 105 non-commissioned officers and men. This augmentation consisted of the 43rd Company Royal Engineers, a detachment of the York and Lancaster Regiment, and 1 warrant officer and 9 non-commissioned officers and men, Medical Staff Corps. The troops, horses, and stores were conveyed to Fontesvilla, either by the River Pungwe in lighters drawn by a tug, or else by the branch of the narrow gauge railway, only recently completed. From here they were sent in small parties by rail to Chemoyo, 120 miles. The horses had to be conveyed in fly-proof horse-boxes on account of the "Tsetse" fly, which exists in this district. From Chemoyo the troops travelled to Umtali, in three bodies, through a very mountainous and difficult country. On arriving at Umtali the York and Lancaster detachment was recalled, but the Royal Engineers proceeded as far as Salisbury and then returned. Just after arriving at Umtali 4 officers and 150 non-commissioned officers and men, West Riding Regiment, arrived to replace the recalled troops, also one medical officer (Surgeon-Captain C. H. Hale, Army Medical Staff), and 6 of the Medical Staff Corps. The medical establishment now comprised two medical officers, one warrant officer, and 19 non-commissioned officers and men, Medical Staff Corps. The whole force, collected at Umtali, marched on the 28th inst. (about 500 strong, including 70 irregulars), with 43 ox and mule waggons, and the column when closed up extended over a mile, and when difficulties in crossing rivers blocked the way, often extended over 5 miles. Arriving on the 2nd August at the site of an old police hut (Nyamatswitswi river), a small fort was built, afterwards called Fort Haynes. The troops left to garrison it were a detachment of the 2nd West Riding Regiment. The main body formed a "laager." From here on the 3rd August at 10 p.m. the force marched by moonlight and attacked, just before daybreak, the stronghold of the Chief Mekoni, and after two hours' fighting took it by storm and burnt the huts. Our losses were 1 officer (Captain Haynes, R.E.) and 2 men, Mounted Infantry, killed, and 2 Mounted Infantry and one volunteer wounded. I amputated the leg of one of these on the 4th August, and left him and the other sick and wounded in charge of Dr. Lovell (Chartered Company's Service). The force marched on the 5th August, and after several tedious marches reached Marendellas, viâ Headlands, on the 9th inst. Fort Haynes was subsequently abandoned, and a fort of this name established about one march nearer Marendellas (Lesapi). A fort called "Fort Wood" was also built near the Devil's Pass (between Lesapi and Umtali). From Marendellas the strongholds of the Chiefs Gatsi, Marendellas, Maguendi, and several smaller places were visited, but only at Gatsi's, where there were large underground caves, was any serious resistance met. At this place Quartermaster and Hon. Lieutenant Barnes was killed, and a transport driver shot dead at a smaller kraal near by.

The main body only reached Salisbury on the 26th August (just two months from leaving Capetown). The Officer Commanding, who preceded the main column with an escort of 50 men, arrived a week earlier.

On arriving at Salisbury the force was again divided into two main bodies, one company operating round Salisbury (Chichwasha, Mazoe, Zinanootis, &c.), and the other, together with the Natal troop (Chartered Company's forces), proceeding to Charter. This body was under the command of Major Jenner, D.S.O. I accompanied it, being the only army medical officer at the time with the field force. I had, much against my will, to leave Salisbury, where I could have better superintended the medical arrangements of the campaign, because this force would be absent for about two months, and be farther than the remainder of the force from Salisbury, where civil aid was procurable. I left Mr. Hamilton in charge of the company operating round Salisbury, and Dr. Fleming looked after all details in camp. Mr. Hamilton was ordered to send in as soon as possible all sick and severely wounded men to the civil hospital. This arrangement worked very well, and many of the wounded were brought in in two days' time by waggon to Salisbury and left with Dr. Fleming. The other company did not proceed direct to Charter, but to Marendellas to meet a convoy and obtain rations there. We had only one action on the way, and had one man wounded, who died afterwards from his wounds. Arriving at Charter on the 10th September, the force marched 100 miles to the south and south-east, and attacked several strongholds (Umtegega's, Zabi Hills, Gona, and other places). Our losses were two volunteers wounded, five native police killed, and five friendlies wounded. All received treatment. On reaching Charter again on the 25th September 1896, the force rested in camp for a week, and then marched to the Hartley District to meet the remainder of Colonel Alderson's force at Mashamgombi's. This force had been further increased by the addition of three officers and three sections of the Mounted Infantry. After three days' fighting we left the force, again dividing up into two parts, one company proceeding to Lomagemdi's and Senoia, the other to the north and north-east, and returning to Salisbury via Mazor Valley. Our losses at Mashamgombi's were three killed (irregulars) and 14 wounded, including two officers (Imperial) and 1 officer, Chartered Company's troops, viz. :—Captain Sir H. W. McMahon, Bart., Lieutenant Eustace (Mounted Infantry), and Lieutenant Ash (Artillery Troop, Rhodesian Horse). The last-named officer was very severely wounded in the arm, and the limb was at once amputated on reaching camp. I accompanied the wounded into Salisbury (50 miles), and placed them and the sick in Salisbury Hospital. I afterwards rejoined the troops at Mazor Fort, and both halves of the force returned to Salisbury on the 10th November. Here they remained in camp until they marched to visit Chikà Kwa's and Kumzi's country, 50 miles to the north-east of Salisbury. No further fighting occurred. After the main body had marched on to Salisbury the irregular troops and some of the West Riding Regiment under Major Watts again visited Mekoni's kraal and took him prisoner, and destroyed his caves. Another force under Major Evans visited Gatsi's stronghold. No casualties occurred at Mekoni's, but Major Evans was mortally wounded at Gatsi's (20th October), and several irregular troops were killed and wounded at minor engagements on the lines of communication. The rainy season was now approaching (20th November), and heavy thunder showers were occasionally experienced, but the real rainy season was exceptionally late, and although the first body of troops did not leave Salisbury till 30th November and the last 8th December, they made a rapid march to Umtali in nine days, not experiencing very much discomfort. The country after leaving Umtali was unusually dry, and no delays occasioned by impassable rivers occurred. The Mounted Infantry and the sick and wounded left Umtali on the 10th December, and embarked on the "Pongola" at Beira and sailed for Durban on the 18th December. The remainder of the troops marched in three bodies and reached Beira on the 30th December, and, embarking on the 31st December, reached Durban on the 3rd January. The troops proceeded to Pietermaritzburg. I left Durban at once in the "Scot" for Capetown, and so was separated from the Mashonaland field force.

The preceding remarks are given somewhat fully to enable the following details of medical organisation, &c., to be more easily understood.

Hospitals.

(1.) Before leaving Umtali (where I was only two days), I procured a building (headquarters of the Rhodesia Horse) and had it equipped with the beds, bedding, cooking and other utensils (procured in Umtali) for the accommodation of 12 men. The building was not in every way suited for the purpose, but at the time was the only one procurable. The civil hospital patients were then accommodated in the jail, and the real hospital building was vacated, it being considered unsafe, owing to its distance from the "laager." Afterwards, when it was re-occupied, the patients in the military hospital were placed in the police huts, near the civil hospital, which I had originally asked for before leaving Umtali, and had been refused. This small hospital was originally intended for use as a base hospital, and established by me, in accordance with orders received from Colonel Alderson, for the reception of the sick and wounded sent back from up country. The Devil's Pass, which was strongly defended, having been avoided going up country, we had no wounded till we reached the police huts near Mekoni's, and then the distance was too great to send wounded back. Dr. Englebach (a Chartered Company's surgeon who had just arrived) was left in charge at Umtali. The hospital was chiefly used for the sick of the Chartered Company's troops, and as a resting place for sick and wounded sent down convalescent from the front.

(2.) Police huts (Fort Haynes, first site).—Dr. Lovell (Chartered Company's Service) was left here to look after sick and wounded when we left (August 5th).

(3.) Fort Wood, established later than above, but between it and Umtali and on the Devil's pass by which we returned. Only a non-commissioned officer, Medical Staff Corps, was here, the sick, &c. being sent into Umtali.

(4.) Lesapi (Fort Haynes, second site).—Surgeon-Captain Hilliard was here for a time, it being a convenient point on the lines of communication, but only held by a few irregular troops. Mr. Malloney (an unqualified medical officer in the Chartered Company's Service) was placed here eventually, and also visited Fort Wood, Surgeon-Captain Hilliard returning to Umtali.

(5.) Marendellas. A post 55 miles from Salisbury.—Surgeon-Captain Hale, A.M.S., was there for a time, and then Dr. Lovell, who treated a large number of sick and some wounded amongst the garrison (about 50 irregulars) and regulars of the escorts who frequently accompanied waggons and supplies up and down the road.

(6.) Salisbury.—Here there was a large civil hospital, very well equipped, with a resident medical officer, dispenser, and nursing staff (Sisters of the Order of Jesus). All serious cases were sent in from camp, and all wounded regulars, irregulars, and natives were admitted into hospital and received every attention. Dr. Fleming was the regular medical officer, Dr. Wyllie acting in his place occasionally. Between 60 and 70 cases of gunshot wounds were admitted into hospital, counting from the time of the first outbreak of the rebellion. The officers and men of the regular troops greatly appreciated the skill and kindness with which they were treated. Had it not been for this hospital, the two army medical staff officers who were with the field force could not have performed their duties, as the force was always divided into two parts. This hospital took the place of the half-field hospital, which was despatched, but never arrived at the front. Plenty of tents could always be obtained for the sick in camp, and a field hospital could have been equipped from the numerous stores in Salisbury if necessary.

Transport.

Only one heavy ox waggon, provided with a hood and very capacious, could be obtained at Umtali. It was very heavy and had no springs, but served the purpose very well. After Mekoni's fight the Salisbury mail coach (of the American pattern) on springs was brought out and used as an ambulance waggon, also at Gatsi's, near Marendellas, and was very useful. After arriving at Salisbury, I obtained two lighter mule waggons on springs, one of which had lockers for stores, and carried six stretchers I used it for the remainder of the campaign. In cases of emergency ordinary mule waggons were covered with a framework of bent branches (this was very well done by native labour), and the sails of the waggons used as hoods. Sacks of grass on the floor lessened the jarring and jolting. This was also much less when a layer of heavy mealies in sacks was first put in. The ordinary waggons, carrying the kits and food supplies for the column, were used for minor cases. The roads being very rough, and frequently crossed by ravines through which streams ran amongst rocks and stones, the jolting was often very severe. No bridges having been built, the angles down which the waggons had to go were very steep, and the severely wounded men were very often carried in stretchers across these places. The ambulance waggons were drawn by 12 to 14 mules.

Medical Comforts.

An ample supply of beef tea, brandy, port wine, champagne, and cornflour (maizena) was always procurable from the Chartered Company's stores.

Medical Officers employed.

With field force and medical officer in charge.	Surgeon-Captain F. A. Saw, A.M.S.
With field force (assistants) -	Mr. Hamilton and Mr. Newham (unqualified medical officers, Chartered Company's Service).
Afterwards - - -	Surgeon-Captain Hale, A.M.S.
Salisbury - - -	Dr. Fleming, Dr. Wyllie.
Marendellas - - -	Surgeon-Captain Hale, afterwards Dr. Lovell.
Fort Haynes - - -	Dr. Lovell, then Mr. Malloney.
Lines of communication -	Surgeon-Captain Hale, afterwards Surgeon-Captain Hilliard, C.M.G.
Umtali - - -	Dr. Englebach until he left, then Surgeon-Captain Hilliard, C.M.G.

As seen from above, there were plenty of medical officers, but a difficulty arose from the fact that the unqualified medical officers were not competent to treat severe cases of gunshot wounds.

Food.

The troops received full field rations—meat, 1 lb.; bread, 1¼ lbs. or biscuit 1 lb.; tea, coffee, sugar, dried vegetables (sometimes fresh vegetables), rice and jam when procurable. The men sometimes received fresh meat, but preferred tinned meat, as the former was often tough and tasteless. They likewise procured pumpkins and sweet potatoes from the kraals. The biscuits were of two kinds, one supply from Capetown (Attewell's) and one supply from Natal. The former were good in quality, but very hard. They were packed in very fragile boxes, and when the boxes got damaged some of the contents were stolen, and the men had often to put up with rather a short supply. The boxes were not tin lined, and some of them got wet from rain and from waggons upsetting in rivers, and these were found afterwards to be mouldy and eaten by insects. The Natal supply consisted of biscuits which were much softer and more easily eaten. They were packed in Government cases tin lined. The troops only had biscuits on the march up, and for a short time when out on patrol later on. They generally had an issue of flour and baking powder. One company had a baker who made bread daily, and the other company and Colonial troops made good bread baked in iron pots with wood ashes. The meat was of two kinds (1) An American brand; (2) Australian Meat Company's brand (Ramornie). The former was often very dry and salt; the latter much superior in quality. Some of the tinned meat (American brand) was found to be bad. I think this came from stores in Salisbury, and had been imported for use in former expeditions. A good deal of it was condemned as unfit for use. The men sometimes received "Maconochie's rations." These were in 2 lb. tins holding meat and a large quantity of vegetables of various kinds. They were much appreciated, but a difficulty arose on account of the men complaining they did not get 1 lb. of meat each, such a quantity being evidently the minimum necessary when doing hard work.

The troops on the whole were well fed, but suffered towards the end from want of variety rather than want of actual quantity of food. Jam was issued as a rule and much appreciated, for, besides possessing antiscorbutic properties, it helped the men to eat their ration of plain bread. An issue of rum was given early in the campaign, and when coming down country a ration of "Dop" at night was issued. This was useful when the men arrived in camp wet, and had no chance of drying clothes.

Nature of the Country and Climate.

The nature of the country through which the troops passed on landing at Beira may be described as follows:—The country as far as Fontesvilla is very flat, and, for 20 miles beyond, the land scarcely rises above the level of the sea. Then the country becomes hilly and covered with forest. Chemoyo, the railway terminus where the troops arrived in June, stands at about 2,000 feet above the sea. The distance from Beira to Fontesvilla is 60 miles by river and about 45 by land. From Fontesvilla to Chemoyo it is 120 miles. The country between Chemoyo and Umtali is very mountainous, the roads being very bad, intersected by frequent small rivers and ravines. The railway had extended as far as Bandoolas (20 miles from Chemoyo) on our return, and would shortly be extended over the Revue river, across which a bridge has been built. The country gradually rises from Umtali (Manica) to Marendellas and becomes more open, but frequent ranges of granite mountains occur, some of them isolated hills rising abruptly out of the level of the plain. Marendellas stands at an elevation of over 5,500 feet (higher than Salisbury). The country between Marendellas and Salisbury is more level and the roads are much better for travelling. The country round Salisbury is open and undulating, but ranges of low hills or "kopjes" abound. The country round Charter is very level and is known as the Charter Flats, whereas towards Hartley, Mazoe, and especially Chiká-kwa and Kunzi's country, it is very mountainous.

Seasons.

The rainy season begins as a rule in November and ends in March, but rain does not fall in all these months and may fall in November, and be followed by one or two months of fine weather, or the rains may be late and not fall till the end of December and then heavy rain may be expected later on. Sometimes the rain is evenly distributed over five months, but, as a rule, a fair amount of fine weather may be expected in the rainy season, whereas during the first and last months of the fine weather heavy thunderstorms may occur. On the highest plateaus around Salisbury in May, June, and July the sun has little heat and the nights are cold. After August the sun increases in power, but the nights are cool till October. The month before the rains is always the hottest. During the rainy season the heat is greatly mitigated, cloudy days often occurring. The nights are cool and very cold in April. From the 1st May to end of December the climate is very healthy, but in the low lying parts malaria is prevalent from the end of November to the bginning of June.

The most unhealthy month appears to be that following the cessation of the rains. Men arriving in Mashonaland with fever in their system are apt to suffer from relapses from exposure to cold winds that prevail on the high tablelands, whereas healthy people enjoy excellent health. The troops arrived at Beira (3rd July) at a very healthy time of the year, and did not suffer from fever, though cases of dysentery occurred, due, in many cases, to drinking bad water from stagnant pools contrary to orders issued. The troops slept out practically in the open ("in laager") for the first three months, and after that only obtained the scanty shelter provided by a covering made with the waggon sails. On the whole they enjoyed very good health. The nights at first were very cold, and at Marendellas frost was seen on the grass in the early morning. The sun was hot, as a rule, at midday, but much mitigated in severity by strong breezes which blow over the high tablelands of Mashonaland. Water was plentiful, good streams, small rivers, and pools occurring at intervals of 5 to 10 miles. Care had to be taken in selecting the source of water, as a great number of oxen had died from rinderpest, and they appear to invariably die near or actually in the water. Later on deaths from "horse sickness" and starvation occurred very frequently amongst the mules and horses, and they often were found in rivers and streams. The men, as a rule, bathed in streams and rivers we camped near, the effects being very beneficial, and no cases of malarial fever could be traced to this cause.

Clothing.

The Mounted Infantry on leaving England were equipped with the following principal articles of clothing:—Helmet (white), serge tunics (red in some cases, black in the Rifle Company and Irish Rifles), 2 pairs of riding breeches, 2 pairs of putties, 2 pairs of boots, one overcoat, &c.; bandoliers and belt for ammunition. A suit of khaki drill was issued as a "sea kit." The clothing had the following defects:—The helmets require khaki covers, but this was obviated by staining them with strong coffee. The cloth clothing (tunics of red or black serge) was found not only to be very conspicuous at a distance, because of its colour, but far too thick for wear in the daytime, especially in the laborious work of climbing hills and "kopjes" on which the kraals were always built. They were useful to put on at night. The men were ordered to leave their calvalry kit bags at Umtali, containing one shirt, one pair of trousers, serge coat, one pair of boots, and one pair of socks. They were never forwarded as intended, and hence the men had only one suit of khaki, and one pair of boots, one shirt, and one pair of socks to wear. The Chartered Company issued a large quantity of clothing to the men (coats, shirts, socks, and boots), otherwise they would have been very short of wearable clothing. They recovered their clothing on returning to Umtali, so all appeared on arriving at Durban much better clad than they usually were. The red and black serge coat was much too hot for use, even early in the hot season (July), and later on the men generally wore none at all, and rode or marched in shirts and trousers only, any coat being an incumbrance.

Special Diseases.

Diarrhœa and dysentery were frequent, but not of a severe type, also remittent fever, but all these diseases occurred much more frequently amongst the Chartered Company's troops, many of whom came to the country after residence in malarious districts, and had undergone no medical examination before enlistment. "Veldt" sores were extremely frequent on the hands amongst the officers and men, but they were not entered as admissions. The smallest abrasion generally developed into a spreading sore unless it was dressed and kept protected from the sun. This was rather strange, as large wounds treated antiseptically always healed rapidly. The troops passed through the low lying country on their return without much harm, but several cases of remittent fever occurred amongst the officers and men on board ship, and many more cases have occurred since their return to Pietermaritzburg, Natal.

Return showing the **Strength, Admissions into Hospital**, and **Deaths** among the British Troops, Mashonaland Field Force from 26th June 1896 to 3rd January 1897, with ratios per cent. per annum.

Average Annual Strength.	Officers, 14.				W. and N.C. Officers and men, 266.			
Diseases.	Admissions into Hospital.	Deaths.	Rate per cent. Admissions.	Rate per cent. Deaths.	Admissions into Hospital.	Deaths.	Rate per cent. Admissions.	Rate per cent. Deaths.
I.—GENERAL DISEASES.								
Group "A."								
Sub-Group I. Small pox	—	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—	—
Enteric Fever	—	—	—	—	—	—	—	—
Other Continued Fevers	—	—	—	—	16	—	6·0	—
Cholera	—	—	—	—	—	—	—	—
Dysentery	1	—	7·1	—	34	—	12·8	—
Other Diseases	—	—	—	—	—	—	—	—
Total	1	—	7·1	—	50	—	18·8	—
Sub-Group II.—Malarial Fevers	3	—	21·4	—	36	—	13·5	—
Sub-Group III.—Septic Diseases	—	—	—	—	—	—	—	—
Sub-Group IV. Syphilis, Primary	—	—	—	—	—	—	—	—
" Secondary	—	—	—	—	3	—	1·1	—
Gonorrhœa	—	—	—	—	1	—	·4	—
Total	—	—	—	—	4	—	1·5	—
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—	—	—
Group "B."								
Sub-Group I.—Parasitic Diseases	—	—	—	—	1	—	·4	—
Sub-Group II. Scurvy	—	—	—	—	—	—	—	—
Alcoholism	—	—	—	—	—	—	—	—
Group "C."								
Debility, &c.	—	—	—	—	2	—	·7	—
Group "D."								
Rheumatism	—	—	—	—	5	1	1·9	·38
Tubercular Diseases	—	—	—	—	—	—	—	—
Other Diseases	—	—	—	—	—	—	—	—
II.—LOCAL DISEASES.								
Diseases of the—								
1. Nervous System, Nervous Diseases	—	—	—	—	—	—	—	—
1. Nervous System, Mental "	—	—	—	—	—	—	—	—
2. Eye	—	—	—	—	1	—	·4	—
3 & 4. Other Organs of Special Sense	—	—	—	—	1	—	·4	—
5. Circulatory System	—	—	—	—	1	—	·4	—
6. Respiratory "	—	—	—	—	4	—	1·5	—
7. Digestive "	—	—	—	—	40	—	15·0	—
8. Lymphatic and Glandular System	—	—	—	—	1	—	·4	—
9. Urinary System	—	—	—	—	1	—	·4	—
10. Generative	—	—	—	—	—	—	—	—
11. Organs of Locomotion	—	—	—	—	3	—	1·1	—
12. Connective Tissue	—	—	—	—	3	—	1·1	—
13. Skin	—	—	—	—	—	—	—	—
III.—POISONS	—	—	—	—	—	—	—	—
IV.—INJURIES.								
1. General	—	—	—	—	—	—	—	—
2. Local	—	—	—	—	55	—	20·7	—
3. In Action	4	3	28·6	21·43	14	4	5·3	1·50
No appreciable disease	—	—	—	—	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—
General Total	8	3	57·1	21·43	222	5	83·5	1·88

APPENDIX No. VI.

REPORT OF MEDICAL TRANSACTIONS, &c., NIGER EXPEDITIONARY FORCE.

By Surgeon-Captain C. L. Josling, Army Medical Staff.

Strength. The detachment 2nd West India Regiment, consisting of 4 officers and 107 non-commissioned officers and men, with 2 officers Army Medical Staff, detailed for service in the Niger delta embarked on board the Niger Coast Protectorate steam yacht "Ivy" on January 26th, 1897, for conveyance to Akassa. Fifty hammock bearers and native servants were also taken.

Steam yacht "Ivy." The accommodation on the "Ivy" was just sufficient; most of the troops slept under the awnings on deck. The sanitary arrangements were satisfactory. Field service rations were issued. No sickness occurred during the voyage. The "Ivy" arrived at Akassa on the 1st February, and the troops disembarked on the 2nd inst. It was at first intended that half the detachment should proceed up the river to Sabagreya, one of the Royal Niger Company's stations, about 60 miles away, but orders were received at Akassa for the whole detachment to remain there.

Akassa. Akassa is built on a clearing on the right bank of the River Niger, about five miles from the sea, and, except on the river side, is surrounded by mangrove swamps, which come close up to the station. The surrounding country consists of very low lying land covered by almost impenetrable bush, the trees not being of any great size. It is intersected by numerous creeks connecting the various mouths of the River Niger. These creeks are bordered with belts of mangrove trees, and at low tide the emanations from the mud banks on which they grow are very characteristic and unpleasant, and frequently cases of fever can be directly traced to a short exposure to them. The whole of the Niger delta is extremely malarious, and one of the most dangerous forms of the disease (Blackwater fever) is frequently met with amongst Europeans. The temperature during February and March varied from 80° to 88° F. During the latter part of March there were several falls of rain.

Quarters, troops. The troops were quartered in a large shed with a concrete floor and zinc roof; the doorway and large openings under the eaves provided sufficient ventilation.

Quarters, officers. The officers inhabited the rooms of the Agent-General, Royal Niger Company, in a building well raised above the ground.

Hospital. The building used as a hospital for the Kroo boys of the Royal Niger Company was given up for the use of the detachment. It was built on piles near the bank of the river, and without crowding accommodated eight sick; a small surgery was attached. Stretchers were used as beds for the more serious cases.

Latrines. Latrines were built on piles on the bank of and overhanging the river, so that all excrement was speedily carried away at any state of the tide.

Cooking. Cooking was done at improvised fire-places.

Rations. The field service rations were as follows:—Preserved meat, 1 lb.; biscuit, 1 lb.; tea, $\frac{1}{6}$ oz.; coffee or chocolate, $\frac{1}{3}$ oz.; sugar, 2 oz.; salt, $\frac{1}{2}$ oz.; pepper, $\frac{1}{36}$ oz.; preserved vegetables, 1 oz., or rice, 2 ozs.; $\frac{1}{10}$th gill limejuice and $\frac{1}{4}$ oz. sugar at the discretion of the officer commanding on the recommendation of the medical officer. At first limejuice was issued twice a week, but during the last two or three weeks more frequently. Yams, bananas, and panpans could sometimes be purchased, but on account of the paucity of villages and their small size it was almost impossible to obtain sufficient supplies to vary or supplement the field service rations. Fish was occasionally procured by drawing a seine in the river.

Water. Rain water collected from the zinc roofs of the sheds and stored in large covered iron tanks was the only water obtainable for drinking and cooking purposes; the daily ration was about one gallon per man. The water was filtered in Morris filters.

Water, washing. The water used for washing purposes was obtained from a well, and was full of vegetable organic matter.

Hammock bearers, &c. The hammock bearers and servants were quartered in the unoccupied huts of the Royal Niger Company's Hausa force, and were quite separate from the troops.

Parades, &c. The usual parades and fatigues were held.

S.S. "Biafra." On April 2nd the detachment was embarked on board the s.s. "Biafra" for conveyance to Sierra Leone. The men were accommodated in the after-part of the ship, one of the holds being cleared out for them, but most of the men preferred sleeping on deck. A second-class cabin containing three berths was set apart for the accommodation of the more serious cases of sickness. The health of the troops during the voyage was good, and the sanitation of the ship in every way satisfactory.

Medical Transactions.

General Health. The health of the detachment while at Akassa, considering that it was not the most unhealthy period of the year, was indifferent, more than 50 per cent. being admitted one or more times. The detachment was away from Sierra Leone for 84 days, and during this period there were 84 admissions from amongst the non-European troops alone, and of these 70 cases were admitted while at Akassa.

Remittent fever. Remittent fever caused the greatest number of admissions, 59 cases; most of them were of a mild type, remaining from 3 to 12 days in hospital. In most cases a diaphoretic and quinine, preceded by 3 to 5 grs. of calomel, was sufficient to reduce the temperature. One case of greater severity amongst the non-European troops was in hospital for 38 days. The most serious case, however, that of Company Sergeant-Major ———, a European, occurred on the homeward voyage. He was admitted on the 2nd April, the day of embarkation, the temperature ranging for the next four days from 100° to 103°. On the 7th April there was a sudden rise to 105°, and about half-an-hour later it reached 108·4. He was unconscious for some hours, and his recovery was ultimately due to prolonged immersion in an iced bath (for 25 minutes) after sponging and the wet pack had been resorted to without success. The temperature was reduced to sub-normal, but during the night it again reached nearly 107°, but on this occasion sponging with iced water was successful in reducing it. On arrival at Sierra Leone he was invalided for change to England.

Venereal. No venereal disease was contracted as there were no women at Akassa, and on account of the almost entire absence of trading intercourse between the Royal Niger Company and the people of this portion of the Niger delta, none even visited the station.

Ringworm. There were a few admissions for ringworm, and several mild cases were treated out of hospital. Carbolic lotions 1 in 5 and 1 in 10 were usually effectual in curing the disease.

Sore-throat and diarrhœa. A few cases of sore throat and diarrhœa were admitted.

Orchitis. Tubercle of lung. One case of orchitis was transferred to Tower Hill Hospital on arrival at Sierra Leone, as was also an advanced case of tubercle of lung. The latter case was that of an orderly of the Fixed Hospital Establishment; the physical signs of the disease first appeared at Akassa, and soon large portions of the right lung were affected. All the other symptoms of the disease were very pronounced.

In the subjoined table are given the sickness and mortality among the officers, European warrant and non-commissioned officers, and non-European non-commissioned officers and men, arranged according to the different groups and orders of diseases.

RETURN showing the STRENGTH, ADMISSIONS INTO HOSPITAL and DEATHS among the EUROPEAN OFFICERS, EUROPEAN WARRANT and NON-COMMISSIONED OFFICERS, and NON-EUROPEAN NON-COMMISSIONED OFFICERS and MEN of the NIGER EXPEDITIONARY FORCE, from 26th January to 20th April 1897.

Average Strength.	European Officers, 6.		European W. and N.C. Officers, 2.		Non-European N.C. Officers and Men, 105.	
Diseases.	Admissions into Hospital.	Deaths.	Admissions into Hospital.	Deaths.	Admissions into Hospital.	Deaths.
I.—GENERAL DISEASES.						
GROUP "A."						
Sub-Group I. Small-pox	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—
Enteric Fever	—	—	—	—	—	—
Other Continued Fevers	—	—	—	—	—	—
Cholera	—	—	—	—	—	—
Dysentery	—	—	—	—	—	—
Other Diseases	—	—	—	—	—	—
Total	—	—	—	—	—	—
Sub-Group II.—Malarial Fevers	7	—	4	—	59	—
Sub-Group III.—Septic Diseases	—	—	—	—	—	—
Sub-Group IV. Syphilis, Primary	—	—	—	—	—	—
„ Secondary	—	—	—	—	1	—
Gonorrhœa	—	—	—	—	1	—
Total	—	—	—	—	2	—
Sub-Group V.—Hydrophobia, &c.	—	—	—	—	—	—
GROUP "B."						
Sub-Group I.—Parasitic Diseases	—	—	—	—	5	—
Sub-Group II. Scurvy	—	—	—	—	—	—
Alcoholism, &c.	—	—	—	—	—	—
GROUP "C."						
Debility, &c.	—	—	—	—	—	—
GROUP "D."						
Rheumatism	—	—	—	—	1	—
Tubercular Diseases	—	—	—	—	1	—
Other Diseases	—	—	—	—	—	—
II.—LOCAL DISEASES.						
Diseases of the—						
1. Nervous System Nervous Diseases	—	—	—	—	1	—
Mental „	—	—	—	—	—	—
2. Eye	—	—	—	—	2	—
3 & 4. Other Organs of Special Sense	—	—	—	—	—	—
5. Circulatory System	—	—	—	—	—	—
6. Respiratory „	—	—	—	—	1	—
7. Digestive „	—	—	—	—	6	—
8. Lymphatic and Glandular System	—	—	—	—	—	—
9. Urinary System	—	—	—	—	1	—
10. Generative „	—	—	—	—	2	—
11. Organs of Locomotion	—	—	—	—	—	—
12. Connective Tissue	—	—	—	—	—	—
13. Skin	—	—	—	—	2	—
III.—POISONS	—	—	—	—	—	—
IV.—INJURIES.						
1. General	—	—	—	—	—	—
2. Local	—	—	—	—	1	—
3. In Action	—	—	—	—	—	—
No appreciable disease	—	—	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—
General Total	7	—	4	—	84	—

APPENDIX No. VII.

REPORT ON THE SEVENTH ANNUAL SESSION OF THE ASSOCIATION OF UNITED STATES MILITARY SURGEONS, HELD AT COLUMBUS, OHIO, MAY 25-27, 1897.

By Hon. Deputy Surgeon General W. S. Oliver, M.D., Retired Pay, Army Medical Department.

In accordance with instructions I proceeded from Halifax, N.S., on the 22nd May, 1897, to attend the Seventh Annual Session of Military Surgeons of the United States, held at Columbus, Ohio, on the 25th, 26th, and 27th May, 1897, and arrived there on the night of the 24th May.

The original conception of the meeting was entirely due to the sagacity and forethought of one of America's most illustrious surgeons, Colonel Nicholas Senn, Surgeon-General, Illinois National Guard, who in 1891 evolved the idea of founding this Association for the purpose of promoting and developing military medicine, surgery, and hygiene in every possible way, and especially by the encouragement of mutual acquaintance amongst military surgeons, also professional relations, and discussions on military medical matters, for the purpose of stimulating scientific growth, and the devising of the best medico-military means of advancing and improving military surgery, equipment, carriage and transport of sick and wounded, and general sanitation, to meet the present exigencies of war.

Also for the establishment between medical officers of the different Services of a reciprocal interchange of views and ideas, and a collective force of inventive energy and action, which cannot fail to be of advantage to both, as well as for the benefit of the Service at large.

Since its inception in 1891, the number of members has increased from 62 to 406, most of whom, from the National Guard, are amongst the most distinguished civilian surgeons in the States.

The meetings are held annually (by invitation) in different States, and are opened with great interest and ceremony by the Governor of the State and the leading military and civil dignitaries.

The State House at Columbus, in which most of this year's meetings were held, is a massive structure covering in its building alone an area of over two acres of ground.

There are numerous hospitals in the city, most of them under the Sisters of St. Francis and the Holy Cross; also hospitals for children and women, an insane asylum, and an institution for the feeble-minded youth, in which more than 1,000 idiotic and imbecile children annually receive treatment and educational training. There are also schools for the blind and deaf.

The opening session of the Association was held at 10 o'clock a.m. on the 25th May in the large High Street Theatre, which was densely crowded, the body of the building being reserved for military officers and members of the Association, who were in uniform, while on the stage (where I was honoured with a seat) were many distinguished representatives, including the Hon. A. S. A. Bushnell, Governor of Ohio, General Axline and Staff, the Mayor of the City, the Hon. Samuel Black, Dr. Millikin, President, Ohio State Medical Society, Medical Director Commodore Albert Gihon, President of the Association, and Surgeon-General Nicholas Senn, founder of the Association.

Captain James Pilcher, U.S.A., chairman of the local committee, opened the meeting, welcoming the members, and referring in glowing terms to the nature, utility, and object of the organization, and the great future in store for it, and concluded his address by stating that "to it and like associations is " entrusted the highest of all missions, the relief of pain, saving of life, suc" couring the wounded on the battle field, and rendering obsolete by every " human means possible the 'Horrors of War.' Inadequate preparation in " this respect slew 33 per cent. of the allied armies in the Crimea; and of " the 250,000 brave men who perished in our rebellion of 1861, at least one" third of the fatalities were directly chargeable to similar medical mismanage-

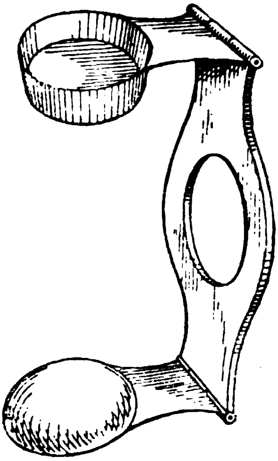
“ ment and inexperience. But before the close of that war, professional
“ enthusiasm and scientific inventive energy produced results so tremendous
“ as to create an era in military medicine unexampled in the splendour of its
“ achievements and universality of its accomplishments. And upon the
“ military surgeon of to-day falls the duty of maintaining this brilliant legacy
“ of progress and growth in undiminished lustre; and for that purpose associa-
“ tions like this should be organised, and with that object this meeting has
“ been appointed.”

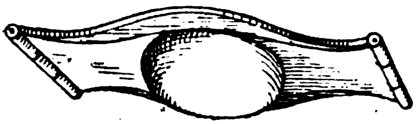
Other similar addresses were delivered by Governor Bushnell, the Mayor of the City, Surgeon-General Senn, Commodore Gihon, and General Axline.

The afternoon session was held at 2 o'clock p.m. in the Senate Chamber of the State House, where, however, reports from standing and special committees occupied most of the afternoon, and it was after 4 p.m. before the first paper was read. A very interesting one was that by Medical Inspector (Commodore) I. Wise, U.S. Navy, on the “ More Efficient Organisation of the Medical Department of our Ships of War,” in the course of which he pointed out very forcibly the urgent necessity for the two-fold increase of the medical staff on each ship in time of war, and their distribution in different parts of the ship in action, the supply of First Aid Packets (Esmarch's) to each of the crew, and their thorough instruction in First Aid in Emergency Cases. He pointed out the futility of all appliances for handling wounded in naval engagements, and advocated the use of the method of hand carriage by one or two men, as prevailed under the necessities of actual combat in the late China-Japanese war. The others papers read and topics discussed were the Hospital Corps of the National Guard, Pennsylvania, by Major Ik. Weaver, Surgeon 1st Brigade, and the Hospital Corps of Connecticut, by Major Laliene La Perrier, Surgeon N.G.

In the evening a brilliant reception was tendered the delegates by the Governor.

The morning session of the second day was again held at the State House at 10 a.m., Commodore Gihon presiding, when a very entertaining review of the second Pan-American Congress was read by Colonel Charles Alden, Assistant-Surgeon-General, U.S.A., military delegate to the Congress, Mexico, November 1896.





The Nominating Committee also made a selection of officers for the coming year, and Brigadier General Griffith, Surgeon-General N.G. of Kansas City, Mo., was elected president, and that city selected as the place of meeting. Press of time, and absence of some of the members whose papers should be read at this session, necessitated their being “ read by title ” and ordered to be published in the official proceedings of the meeting—these included three important subjects, “ The Practical Disinfection of Ships of War ” by Surgeon-Lieut. Craig, U.S. Navy; “ Camp Sanitation,” by Captain J. Ewin, Surgeon N.G. Ohio; and “ Remarks “ on Mountain Campaigning from a Medical Stand-Point,” by Captain Henry Birmingham, Surgeon U.S.A., with special reference to the use of the “ Travois ” on those occasions. I shall hereafter refer to this subject. At the afternoon session Major Henry Moore, Ohio N.G., exhibited a very simple and ingenious “ Field Appliance for the Extempore Preparation “ of Hypodermic Solutions,” consisting of a small light aluminium instrument, of the size and shape here delineated, and capable of holding in its upper cup from ʒ ss. to ʒ i. of water, which is boiled by lighting under it a single match. When folded, it occupies but little space, and the basement spoon laps over that used for boiling, and prevents the latter soiling the pocket, if required to be replaced there in haste.

A paper on the "Use of Kola in Military Practice," by Colonel G. Penrose, Surgeon-General Utah N.G., Salt Lake City, was specially interesting, and elicited much discussion. Doubt was, however, expressed by some as to the feasibility of inducing soldiers to use it with due care and discretion, and reserve it for critical occasions of mental and bodily strain and fatigue.

Papers of interest on "The Cause of Degeneration in Military Life," "Personal Equipment for Field Service," and "Regimental Instruction in First Aid," were unfortunately "read by title," owing to the absence of their compilers. I would here remark, however, regarding "Regimental Instruction in First Aid," that I see by the Surgeon-General's Report on the United States Army for 1896, that special instructions in the duties of stretcher (litter) bearers, and in the method of rendering First Aid to the sick and wounded, is now given to all enlisted men of the United States Army by their company officers, in accordance with General Order No. 9, Head Quarters of the Army, March 13, 1896.

In a very instructive paper on "First Aid in the Firing Line," by Captain J. Ewin, Surgeon Ohio N.G., much stress was laid on the advisability of dispensing at this critical and exposed point with the use of stretchers, and removing wounded entirely by hand carriage by one, or two, or three bearers to the "collecting stations"; and he urged the necessity that existed in future wars of having all soldiers instructed in this mode of carriage, and in the first principles of controlling hæmorrhage chiefly by elastic pressure, utilizing their braces (which should be elastic) for that purpose, especially as regards the extremities. This would admit of the bearers procuring individual shelter until the critical moment for their services arrived. Many a wounded man's life might be saved by his knowing, or his comrade knowing, how to arrest hæmorrhage temporarily by applying his brace to his leg or arm.

On that evening, Wednesday 26th, a reception was tendered the Association by the ladies and officers of the 17th Regiment U.S. Army at the Columbus Barracks.

The 3rd and last day's session opened in the Senate Chamber of the State House at 10 o'clock, when Brigadier General Jefferson Griffith delivered a highly entertaining and instructive lecture, on "Some Effects of Bullets," illustrated on a large scale by the stereopticon.* A number of bones, skulls, &c. were also exhibited, showing the effects of the various modern small arm bullets and shrapnel shell; also numerous photographs of injuries from the same, inflicted on live animals, dogs, horses, and cattle, as well as on dead human bodies furnished by Government for the purpose.

At the close of this lecture, the Association adjourned to the Sterling Medical College, where, amongst other subjects brought forward for consideration, was one on "the Ambulant Treatment of Fractures" by Major E. Martin, Surgeon N.G. Pa.

During the past two years this treatment has been gaining favour in America, especially at the Roosevelt Hospital, where it has been extensively practised in cases of simple fractures of one or both bones of the leg, the plaster splint being applied from the toe to the knee over only a roller bandage. In the cases treated by Major Martin he padded the whole limb with cotton, and strengthened the plaster with side pieces of malleable iron. The patients were allowed to walk with a stick or crutch in two days, and the plaster splint was removed as a rule in four weeks.

Three cases of "Radical Cure for Inguinal Hernia in Soldiers" (Bassini's operation) were also exhibited at this meeting by Major J. Banister, Surgeon U.S. Army. The operations were performed three years previously, and seemed perfectly successful, there being no apparent tendency to relapse, or any testicular or other complication.

On this occasion also Major Henry Moore, Surgeon N.G. Ohio, demonstrated on an attendant "A New Method of Lifting and Carrying a Patient by Single Bearer." By kneeling on the left knee on the left side of the recumbent patient, and stooping forward, with his left hand, he draws the patient's left arm about his neck, and raising and supporting him with his (the bearer's) right arm about his back, lifts him on to his right knee in the sitting position, he then disengages his left hand, and passing it under and grasping both the patient's legs from beneath, easily resumes the erect position with him in his arms.

---

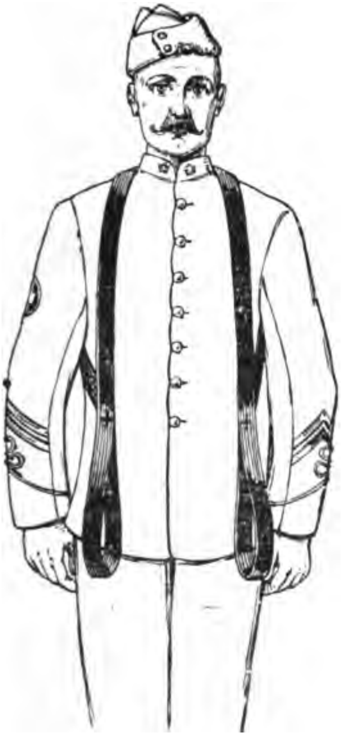
* See Experiments with the new United States (Krag-Jorgensen) Army Rifle. By Ex-Brig.-Gen. J. D. Griffith, N.G.M., Kansas City, Missouri.

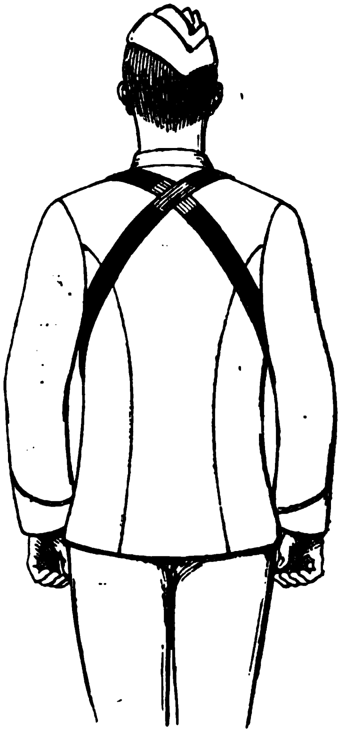
The afternoon closing meeting of the Association took place in front of the hospital, in the magnificent park grounds of the Columbus Barracks, which occupy 18 acres, beautifully laid out in lawns, drives, and parade grounds. In the presence of a large and distinguished assemblage of military and civilians, a demonstration of "first aid" to the wounded, and of stretcher, bearer, and ambulance and Travois drill, was given by the company bearers of the 17th Regiment, and detachments of the Army Hospital Corps, under command of Captain James Pilcher, Assistant-Surgeon, U.S A.

At this parade practical demonstration was given in stretcher and ambulance drills in all their various phases, and was followed by an exhibition of transport of wounded by Travois, and horse and single-bearer carriage. All these exercises were extremely interesting, and were accomplished with a degree of ease, precision, and celerity that indicated a high standard of training and efficiency.*

I desire to call special attention to the stretcher and sling in general use in the regular service and National Guard, as they compare favourably with those last introduced into our army.

While being equally efficient for use in an ambulance waggon, and for other purposes, the total weight of the stretcher is only 16 lbs., including head rest, whereas our stretchers with pillows average 31 lbs. In addition to this, our slings weigh 2 lb. 4 oz. per pair, are hard and cumbersome, and require second aid in their adjustment, whereas the American slings are soft and pliant, and weigh only a little over 1 lb., being composed of blue webbing 2½ inches wide, with leather-lined loops to each end, and are also worn *on the orderly's body all the time in use*, with ends secured in position by passing them under his waist-belt. There is also a shoulder brace sling, having a cross strap



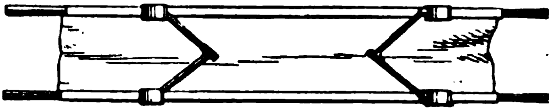


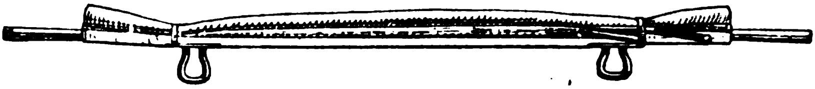
---

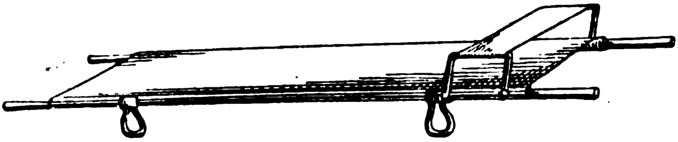
* Descriptions and illustrations of the various forms of bearer exercises and ambulance transport are contained in "First Aid in Illness and Injury." By James E. Pilcher, M.D., Captain in the Medical Department of the United States Army.

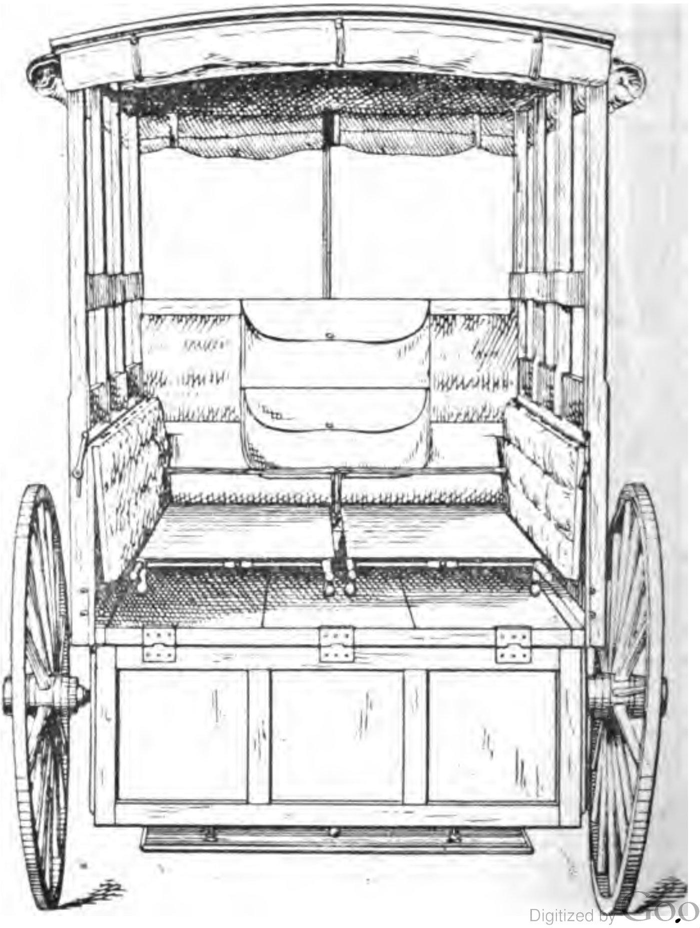
behind the shoulders, and which I prefer, as it avoids neck pressure, distributes the weight better on the shoulders, and retains the sling there without the necessity of passing the ends under the waist-belt.

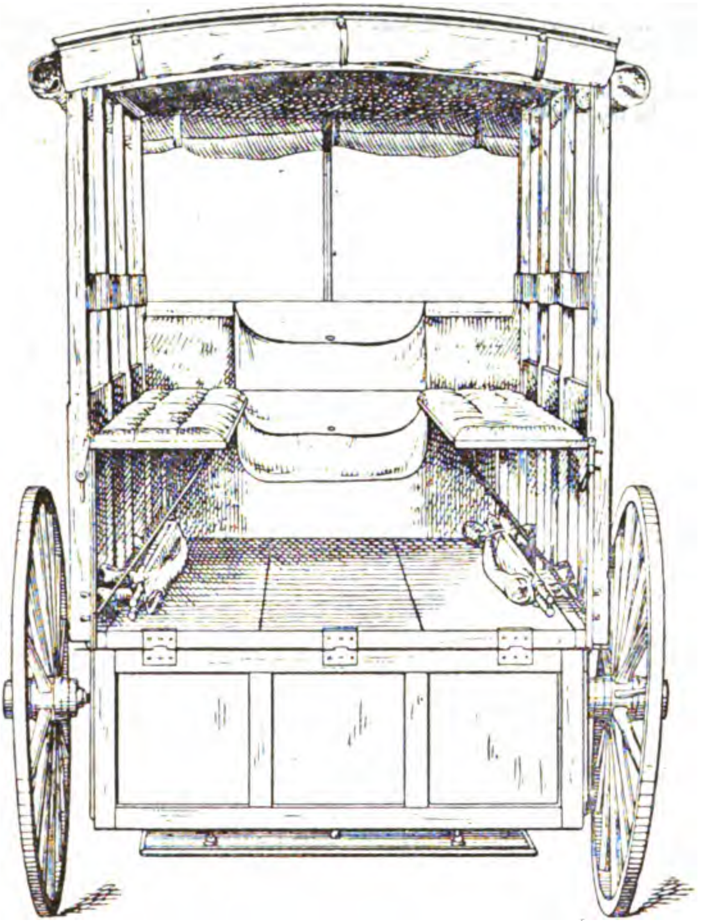
The ambulance waggon in use is light and efficient, weighing only 14 cwt., and carrying water tank (9 gallons) field steriliser, medical and surgical chest, field appliances, spare stretchers (litters), and repairing instruments, as represented in the accompanying illustrations.







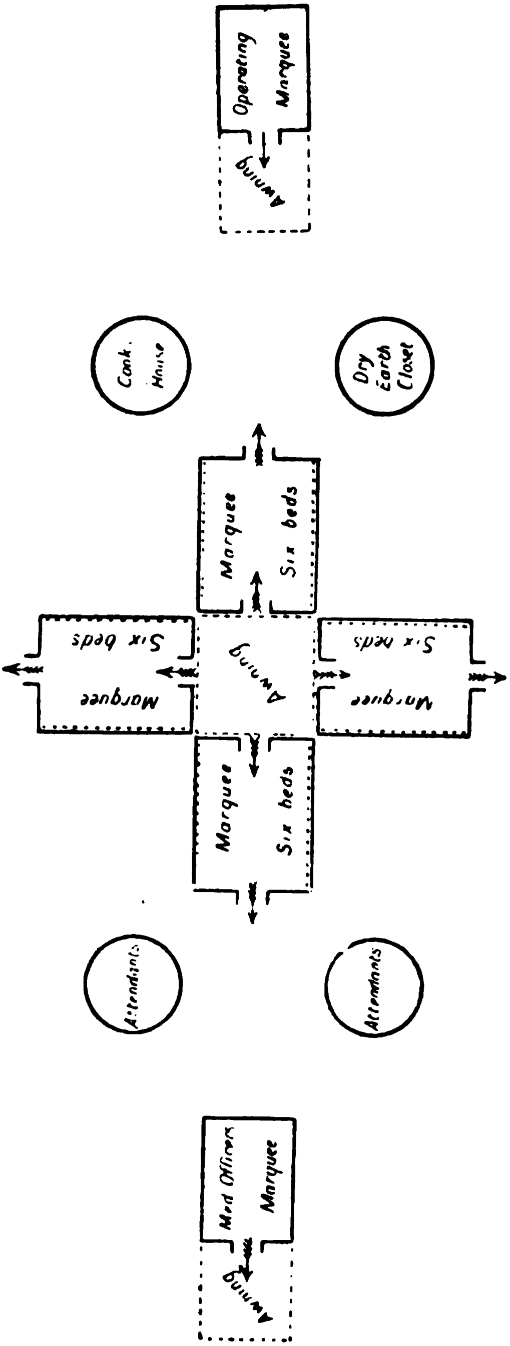




As regards the "Travois," I would here beg to suggest the advisability of utilizing it more extensively, and in a manner different from that now practised in America, by constructing it on a smaller and lighter scale for carriage by man instead of horse, and which would be preferable to "single bearer," or "horse," or ordinary "stretcher," as a rapid method of removing wounded from under fire, from the "firing line" to the collecting station. This could be easily drawn by one bearer, by means of the sling before referred to, especially if the Travois were furnished with two (or even one) rubber tired wheels, or spring steel rests.

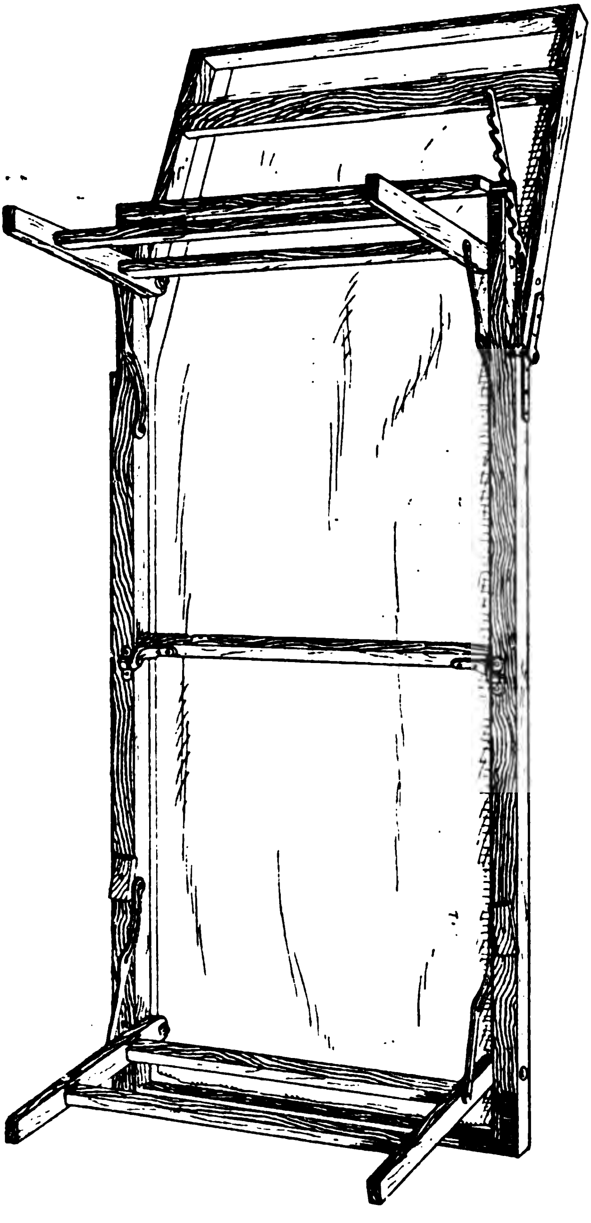
Adjoining the parade ground a field hospital was erected and partially equipped for the occasion with folding field cots, medical and surgical panniers, portable operating table, cooking appliances, &c. It consisted of 10 tents arranged as shown in the accompanying diagram, and included 6 square-walled marquees and 4 circular (bell) tents. Two of the latter, located in front near the medical officer's marquee, were intended for the attendants, and two similar ones in rear of the hospital were for culinary purposes, &c. A walled tent, similar to that for the officers, was also located in rear of the hospital for operating and dispensing purposes, while the other 4 marquees, comprising the hospital proper, were pitched in a radiating manner in the centre of the encampment, and encompassed a square space which was overhung by a high canvas canopy that protected it from the weather, and increased considerably the tent space for extra wounded, while at the same time it admitted of all the sick in the adjoining tents being under the immediate observation of the orderly on duty in this central area.

In addition to this central space, each marquee afforded ample space and accommodation for six wounded, had walls 4 feet high, and was provided with a double roof or awning for protection against severe heat or rain, and this outer fly could also be shifted and used as an awning at the end of each tent if necessary, so as to increase its dimensions still further, as shown in the case of the medical officer's and operating marquees in the diagram.



Single-walled marquees (walls 4 ft. high) with awnings over roof—which can be extended like medical officer's and operating marquees—and square awning, covering interval between the four marquees, allowing of supervision of whole by one orderly.

Six folding field cots were furnished to each marquee, and, as they seemed better adapted for field service than our ordinary iron bedsteads, I think it well to enclose the accompanying photograph, showing the rack and pinion



head rest, folding legs, &c., which admit of easy transport and constant readiness for immediate use.

At the conclusion of the parade, on the courteous invitation of Colonel Rowland, commanding the 17th Regiment of United States Infantry, and Colonel Walters, Assistant-Surgeon-General, U.S.A., I had the pleasing opportunity afforded me of visiting the regimental hospital, which overlooked the grounds on which the exercises had taken place.

It consists of a "central administration building" with two lateral wings, and, in the rear, a similar, but smaller, detached "accessory administration building." The wards are 24 by 78 feet, and 14 feet high, each accommodating 24 patients, which gives an air-space of 1,092 cubic feet per man. Each of these large wards has 16 windows, and the whole hospital is lighted by gas, and heated by the "indirect" radiation plan, "direct" radiation being also available in very cold weather. Ventilation is effected by the same process, by air introduced from without over steam coils in the heating flues, and by the large outlet extractor in the ward, passage, ceiling, &c. Lavatories, sinks, and latrines (the latter on the most approved "flush tank" principle) are provided in the centre building for each ward, and, adjoining them, is a small smoking room. The administration building contains, on the first floor, surgeon's office, with good library, dispensary, steward's office, and an excellent operating room, fully equipped with white japanned table, glass cases, well stocked with instruments, antiseptic dressings, sterilisers, and all modern appliances requisite for operations of every magnitude. While on the upper floor are located neatly furnished rooms for orderlies and store rooms for the clothing of the sick.

The "accessory" building at the rear contains, also, the kitchen, and dining room for attendants and convalescents, on its first floor, while on the second floor, and wholly detached from the basement, is a ward for infectious cases, also a chemical and bacteriological laboratory complete in every respect for the detection, culture, &c. of pathogenic bacteria, chemical analysis, and clinical and sanitary microscopy. A mortuary and a cottage for the hospital steward complete the institution, and render it so elaborate that I was surprised to hear that it was merely a type of the present United States regulation hospital, counterparts of which existed at every army post throughout the country. And I would here remark, that the advantages of this distribution of general hospital facilities, as regards operations, chemical, microscopical, and bacteriological examinations, are clearly evinced in the many able scientific reports which are now furnished annually to the Surgeon-General of the United States Army from the medical officers in charge of the various small outlying hospitals.

In closing this report, I would add that, during the three days' convention, one of the spacious guest chambers of the Chittenden Hotel was engaged as an "Exhibition" theatre of all the most recent inventions and improvements in various surgical appliances and instruments, including sterilising-ovens, dressing cabinets, electrical appliances, field hospital chests, surgical and medical, wheeled and rubber-tyred bicycle litters, operating tables, splints, &c., all extremely interesting and instructive, but too numerous to refer to in this report. As formaldehyde, however, has now attained a prominent position as a most reliable disinfectant, I would mention Hollister's formaldehyde generators, and a proposal to effect the formaldehyde disinfection by means of pastilles. The former was stated to be convenient and adequate for all purposes in ships, military hospitals, quarters, &c., and to render unnecessary the expensive compressed steam sterilisers now under consideration for use in our service.

Improved stethoscopes were also on exhibition under the name of "stethophones" and "phonendoscopes." The phonendoscope (Bazzi and Bianchi's) is especially useful, and most sensitive in its varied actions.

With a view to antisepis, canvas is superseding leather in the United States, as material for surgeons' dressing-cases, and this new holder now forms part of the field equipment in the United States Army.

Bone and vulcanite handles for knives and all surgical and gynœcological instruments are also things of the past, as are also large amputating knives for capital operations on the extremities, the longest in Senn's operating case measuring less than four inches in the blade.*

In conclusion, I would observe that Eucaine is now being extensively tried in the United States with a view to its superseding morphia as a hypodermic injection and (to a certain extent) chloroform as an anæsthetic, in many cases of injury and operations in the field.

---

* *See* Abdominal Surgery on the Battlefield, by N. Senn, M.D., LL.D., Surgeon-General of the National Guard of Illinois.

APPENDIX No. VIII.

REPORT ON THE 12TH INTERNATIONAL MEDICAL CONGRESS, HELD AT MOSCOW IN AUGUST 1897.

By Surgeon-Colonel W. F. STEVENSON, M.B., Professor of Military Surgery, Army Medical School, Netley.

The Twelfth International Congress of Medicine was held at Moscow from 18th to 27th August 1897, and was under the patronage of His Majesty the Emperor and of the Grand Duke Serge Alexandrovitch. Those members who were national delegates were presented to their Majesties the Tsar and Tsaritsa at the Summer Palace at Peterhof on 17th August. About 36 national delegates went by steamer from St. Petersburg to Peterhof, a distance of about 20 miles. The delegates from the United Kingdom were Sir Wm. MacCormac, Sir Wm. Stokes, Dr. Simpson of Edinburgh, and myself. Professor Skliffosowsky, the President of the Congress, presented each delegate to the Emperor and Empress.

There were three general meetings of the Congress; they were held in the Imperial Theatre of Moscow, a magnificent building for functions of the kind, and capable of accommodating 2,500 people.

The first general meeting took place on 19th August, under the Presidency of Professor Skliffosowsky, the Grand Duke, who was also the General Officer Commanding at Moscow, being present.

The usual routine proceedings were carried out; the President delivered the opening address; Professor Roth, the Secretary, read the general report; honorary presidents were elected for the different sections, &c.

Professor R. V. Virchow delivered an address, taking for his theme "The Part played by the Blood-vessels in the Process of Inflammation." Dr. Lauder Brunton read an interesting paper on "The Relations between Physiology, Pharmacy, Pathology, and Practical Medicine"; and Professor Lannelongue, of Paris, one on "The Therapeutics of Surgical Tuberculosis."

The other general meetings were held on Sunday, August 22nd, and on the last day of the Congress. On the latter occasion Sir William MacCormac was invited to act as President of the meeting, and on him devolved the duty of thanking the Russian Government and the Russian medical profession for the facilities which they had given for the assembling of the Congress at Moscow and for the uniform kindness, attention, and hospitality shown to its members.

The military riding school used by the troops at Moscow, a building about 120 yards long by 40 yards wide, was lent by the General Officer Commanding for the purposes of a central office for the Congress. In it also were the offices of each section, a post-office, a reading-room, and a restaurant. Members of the Secretariat Staff attended these different offices and afforded information on all matters connected with the Congress, and at the section offices were arranged all the details connected with the meetings of the sections.

The professional work of the Congress was distributed over 15 sections, and the meetings of the sections were held in the University buildings, the "Réunion de la Noblesse," and some few of them in the special hospitals of the city, such as those for diseases of the skin and of the eyes.

All the sections met at the same hours, and I attended the meetings of the military section only.

There were over 7,000 members present at the Congress, of whom 800 were Germans, the same number Austrians, 400 French, 300 English, 120 Americans, and the majority of the remainder Russians.

The tenth, or military, section met on four days at the Réunion de la Noblesse: there were about 100 military members, mostly Germans, and all, except myself, wore uniform at the meetings of this section. As regards the wearing of uniform, I conformed to the Queen's regulations, and only wore it on the occasion of the presentation of delegates to the Tsar at Peterhof. But I think it is worth while to suggest that, on future similar occasions, some modification of the regulations in this matter should be obtained, and that the military medical officer attending the military section of such a Congress on behalf of the A.M.S. should be directed to wear undress uniform.

The work of the section consisted in the reading of papers, some demonstrations of special apparatus for the treatment of certain injuries and of improved means of carriage of wounded men, especially on board ship, and a visit to the large military hospital situated some miles outside Moscow. At the completion of the Congress the members of Section X. were invited by the officers of the Russian Army Medical Department to visit St. Petersburg. But as I had come to Moscow viâ St. Petersburg, and as the programme of this visit seemed to possess social rather than other attractions, I decided to spend the time at Berlin, on my way home, rather than return to St. Petersburg. I was the more led to this determination as Generalstabsarzt von Coler, the chief of the German Army Medical Department, whose acquaintance I was fortunate enough to make at Moscow, very kindly informed me that he would arrange that I should be shown everything connected with the service of which he was the head, if I stopped at Berlin.

The military section was presided over by M. L. L. Levchine, of Moscow, and Generalstabsarzt von Coler, Sir Wm. MacCormac, myself, and some others were elected honorary presidents.

A large number of papers were read, some of them of considerable interest to military and naval surgeons, but as no extracts of them were printed, and as it was impossible to take detailed notes, I cannot refer to them as fully as some of them deserve. I can, however, give short résumés of some of the papers.

Dr. Van Reypen, Medical Director of the United States Navy, read a paper on "The Care of the Wounded in Modern Wars." He pointed out the difficulty, almost impossibility, of treating wounded men satisfactorily in a modern battle-ship. In consequence of the narrowness of the hatchways, and the confined and tortuous passages in vessels of this kind, it is impossible to transport the wounded from the batteries and decks on which they are injured to a place suitable for surgical interference without the risk or certainty of aggravation of the existing wounds. So great are the difficulties and the risks in this matter, in the opinion of Dr. Van Reypen, that he strongly advocated the general principle that the wounded cannot in justice be allowed to remain in the fighting ships, but must be removed immediately after an engagement to vessels specially detailed and fitted out for their reception; that, in fact, every fleet should have a hospital-ship, or perhaps more than one, attached to it for the purpose indicated.

Dr. Van Reypen showed diagrams of the special apparatus required for slinging wounded men over the side and into boats for transfer to the hospital ship, as well as of the class of ship suitable for the purpose, and of the method of fitting her.

The principle here advocated is no doubt excellent. A modern ship of war is, for many reasons, unsuitable as a place in which to treat a number of seriously wounded men, and any method which will free her of ineffective members of her officers and crew, and place the latter under favourable conditions as regards recovery, will be desirable, both from the point of view of the future efficiency of the ship, and that of the welfare of the wounded.

Brigadier-General Sternberg, head of the medical service of the United States Army, read a paper on the radical cure of hernia as practised by the officers of his department. In the American Army the existence of a hernia is not considered a cause of rejection of a recruit if he consent to an operation for its cure after enlistment. On the other hand, if a soldier develop a hernia he is discharged the service if he refuse operation. Thus a considerable number of cases of operation for this complaint have been performed, and most of them have been so followed up that the results are known to the medical authorities for some years after the performance of the operations. Out of one series of 50 cases treated comparatively lately, in which all the results were known, only 4 had had relapses of their condition, and some of them had been operated on again with success. All medical officers of the American Army are not permitted to do this operation, but only those who have been specially instructed in the various methods of it, and whom General Sternberg considers qualified to undertake it. If an operation of this kind be required at a station where there is no such specially qualified medical officer present, General Sternberg details one to go and carry out the treatment.

Dr. Stechow, Oberstatsarzt of one of the German regiments of the Guards, showed some very fine skiagraphs by the Röntgen Rays, some of them being of the most difficult parts of the body in which to obtain good results by this means, such as the hip-joints, upper parts of the femur, and of the spine; but his were very clear and distinct. The skiagraphs were illustrative of a paper Dr. Stechow read before the section on the subject of the use of Röntgen Rays in the army in peace and war. I afterwards saw the apparatus he uses at the Kaiser Wilhelm's Academy at Berlin; a powerful coil giving a 12-inch spark, and a Crook's tube of much larger size than those usually employed in this country.

Dr. Stechow described in detail the uses to which the Röntgen Rays may be put in surgery; the ease and certainty with which recent fractures and dislocations may be diagnosed, or their absence ascertained in suspected cases of these injuries, and the presence of foreign bodies within the tissues demonstrated, as well as their precise positions. He then pointed out the use a skiagraph would be in cases where recruits might be suspected of exaggerating the permanent effects of old bone injuries in order to escape military service. In countries where service in the army is voluntary the would-be recruit is certain to minimise his disabilities, if any exist, but where service is compulsory the conscript is likely to make the most of them to avoid being enrolled in the army. The true condition of the bone can be discovered, almost with certainty, by means of the Röntgen Rays. So, in the cases of men desirous of being invalided from the army on account of similar injuries, the advantage of a skiagraph will be equally great.

Dr. Stechow referred to the use of the Röntgen Rays in war, and recommended that the apparatus be supplied to base hospitals as well as to stationary field hospitals. But he evidently had in his mind the conditions under which wars in Europe are carried on. It did not occur to him that there could be any difficulty in obtaining the electrical force, for almost every town in Europe has an electric-lighting installation, where accumulators could be recharged. He did not touch upon the almost insurmountable difficulties in the way of using this aid to surgery in such places as the Soudan and Southern Egypt, the Indian frontier, South Africa, &c., where accumulators could not be used, or, at all events, could not be refilled. The use of primary batteries, under these circumstances, instead of accumulators, is out of the question; but what the source of force should be, hand-dynamo or other, has not yet been satisfactorily ascertained. This is a matter which deserves early attention, in order to decide on a means of generating electricity in the absence of accumulators or under circumstances when they cannot be used. As far as our own army is concerned, we cannot, in future, be said to have made the most of modern science if surgeons on a campaign have not the means of taking skiagraphs of bone injuries, and of localizing foreign bodies in the tissues. The large general hospitals at the base of operations, at least, should be equipped for this purpose. Here, there will be no difficulty as regards accumulators to be met, because they can be recharged on board the hospital ships; it will only be when the apparatus is required nearer the front that other means must be employed.

Innumerable papers were read advocating the merits of particular methods of immobilisation in cases of gunshot fracture of long bones and of joints. All manner of splints for this purpose were recommended—tin splints to suit all limbs, and in sizes to fit all cases; splints of plaster, of wood, of zinc; splints of every variety, some of them useful, and some of them only ingenious.

Dr. Henry Turner, an Englishman by birth, but now a naturalized Russian, and Professor of Surgery at the Army Medical School at St. Petersburg, demonstrated one of the best of these. His fixation apparatus is made up of a roll of tow, plaster of Paris cream, and thin elastic webbing like the leg of a stocking. A mass of tow, which, when teased out, is about an inch thick, long enough for the required splint, and wide enough to nearly envelop the limb, is laid upon a table or on a board, and sufficient of the plaster cream to thoroughly saturate it is poured over it. When the plaster has slightly set the stocking-leg material is put round the splint; the limb is then put into proper position and the splint applied, and fastened by some turns of bandage. After a few minutes a perfect cast of the part in its rectified condition is obtained. The power of fixation to be obtained from an apparatus of this kind is very great, and it is suitable for the treatment of compound fractures, windows being made opposite the wounds, or the opening in it along one side being so arranged as to leave the wound uncovered. All plaster splints are heavy, but this one is not cumbersome as well; when the plaster cream is poured upon the loose tow and has been well pressed into its interstices the thickness of the splint is not over a quarter of an inch. It is easy of application and requires but a short time to put on; the knee, leg, and foot can be immobilised by means of it in less 10 minutes. It may be applied as described above, nearly surrounding the limb, or in separate halves, one on either side.

Surgeon Bonomo, of the Italian Army, read a paper on the treatment of penetrating gunshots of the abdomen. He strongly advocated that line of treatment which is now almost universally admitted to afford the only hope of recovery in the vast majority of cases of this almost hopeless class of injury—immediate laparotomy on diagnosis of penetration being made; operation for the control of hæmorrhage and for the repair of wounds of the intestines, and irrigation and drainage of the peritoneal cavity. He gave statistics showing 30 per cent. less mortality in cases so treated than that which follows the expectant plan. He was very insistent on the necessity of drainage; but it is probable that, where the suturing of the intestines is effectively done, hæmorrhage thoroughly controlled, and all foreign matter (blood as well as fæces) removed from the abdominal cavity, these cases do better without drainage than with it.

Many other papers were read at the meetings of Section X., the large majority of them being detailed accounts of cases met with in the practice of the authors, and, though interesting as such, requiring no notice in this report; others of them, on the other hand, carried no special interest for the English army surgeon and need not be referred to here.

The Military Hospital of Moscow.—The members of Section X. were invited to visit the large Military Hospital on the outskirts of Moscow on Monday, 23rd August. It is situated on high ground, about 6 miles from the centre of the city, and is a very large institution, divided into two main portions, one of stone and brick-work and the other a series of wooden huts. In the former the walls are of great thickness, the rooms and wards extremely high, and there was an extensive system of artificial heating (hot air or water) all over it. This part of the hospital is only used during the winter season, while the wooden huts are for occupation during the summer. Each set of buildings appeared to be very suitable for the season during which it is used.

The winter hospital is a rather imposing looking structure, all contained in a single square block of buildings. The wards are at least 30 feet high, and of large cubic capacity; the beds were by no means overcrowded in them. The floors of the corridors and passages are of asphalt, those of the wards and other rooms of wood covered with canvas and painted a light-brown colour. These are excellent floors; they can be easily kept clean, and show no interstices in which dust could collect. The lower parts of the walls (about 5 feet) are also painted, and the remainder lime-washed. The ventilation, at the time of our visit, was very good, all the doors and windows being open, and the wards unoccupied; but the means of ventilation for the winter season, when the doors and windows would probably be shut, did not seem to be nearly sufficient.

The summer hospital consisted of a number of large, square, wooden huts, one story high, built of split logs, the spaces between which were caulked with tow or oakum, like the seams of a ship. The huts were raised off the ground about two feet, and each contained four or five long and narrow wards about 12 feet high, accommodating 36 men each. Besides the wards, each hut contained several small rooms for sick attendants, as well as bath rooms, lavatories, operating theatre, &c. A large number of patients of all kinds, surgical and medical, occupied these buildings, and appeared to be much overcrowded, according to English ideas; wards in which we would place 12 men containing 36. The wards all opened into each other, and had to be traversed to get from one to another. The floors were on the same plan, painted like those of the winter hospital, and equally good. Female nurses and male sick attendants performed the nursing duties in the hospital. The ward-dress of the patients was similar to our own, but of a dirty brown colour, and neither it nor the bedding erred on the side of neatness or cleanliness of appearance.

There was a very perfect apparatus for disinfecting purposes by means of superheated steam, the receptacles being large enough to contain a dozen or more mattresses at one time.

The operating theatre was by no means up to date; a small room with bad light and no overhead light, and a wood floor. It was not a place easily rendered or kept aseptic; two operating tables of ancient construction occupied the centre of the room.

There were two bacteriological laboratories connected with the hospital, and they seemed to be the best and most up-to-date portions of the establishment. They were intended for the use of the medical officers of the hospital for diagnostic purposes, and for teaching bacteriology to the army medical officers who might be sent there for instruction. In the first room we entered in the winter hospital we were shown specimens of all the hospital equipment, utensils, bed, bedding, clothing, &c., &c. They were quite similar to those in use in English military hospitals, and were very suitable for their purposes, but there was nothing amongst them requiring or deserving any special report.

It was impossible to gain much information about the working or administration of the institution, except by observing as much as possible in our walk round it; little or nothing could be learnt by asking questions in consequence of the large number of visitors and the very small number of persons belonging to the hospital who accompanied us. We saw what was to be seen, and nothing further was possible.

International Unification of Medical Statistics.—The International Committee on this subject met and discussed it on three days, but practically nothing was added to the work done at Buda Pest in 1894. On 20th August the secretary to the Special Committee read the report of the proceedings and the recommendations made at Buda Pest. At a second meeting of the special committee the report was approved, and some changes in the forms of statistics were suggested, but they were not pressed, as the representatives of some of the governments stated that their respective War Office authorities would be unable to supply the necessary information, and did not approve of the contemplated changes. At the third meeting all the members agreed as to the advisability of the compilation of army statistics on a uniform system of forms, and that the governments of the different countries should be urged to forward this object to the utmost of their power.

On my return journey I stopped at Berlin for two days. I called at the office of the Army Medical Department and found that the Acting Director General, Generalarzt Stahr, had received a letter from Generalstabsarzt von Coler, and was prepared to forward my desire to visit the Army Medical Institutions at Berlin to the best of his ability. Dr. Krummacher, a staff surgeon on the teaching staff of the Kaiser Wilhelm's Academy, was directed to accompany me and show me whatever I wished to see, and nothing could exceed the kindness and civility of this officer, nor indeed that of all the members of the medical service whom I met in Berlin.

On the first day we visited the Medical Train Depôt at Tempelhof, where I was shown the very perfect arrangement which had been made for rapid mobilisation of 75 field hospitals. The building in which the hospitals were stored was two stories high; on the ground-floor were all the transport vehicles, and on the first floor all the equipment required for this large number of field hospitals. The equipment of each hospital was laid out in separate cubicles on shelves, while the empty panniers and boxes into which it would be packed were ready on the floor of each compartment. For the mobilisation of these hospitals all that had to be done was to pack the equipment into the empty boxes, lower them on to the ground-floor, place them in the wagons there ready to receive them, and the 75 hospitals were ready to march out.

But as the medical train and the Kaiser Wilhelm's Academy have been the subjects of a very full report by Surgeon-Colonel Notter and Surgeon-Major Macpherson, which is published in the Army Medical Reports for 1889, I need not refer to them further, except as regards one matter. At the Academy I was shown a method of rendering small quantities of water germ-free by a simple process suggested by Stabsarzt Dr. Schumburg, and in which the authorities there were much interested and entertained a firm belief. Dr. Schumburg points out in his paper on this subject that, on a large scale, water can be fairly well purified by properly constructed filters and by other means, but that to render small quantities of water free of all forms of bacterial life by means of chemicals which leave the water still fit for drinking purposes has hitherto been impossible. The general principles of his method are as follows: the germicide he employs is bromine in a solution of bromide of potassium; 2 cc. of the solution represents 0·06 grammes of free bromine, and are sufficient for the purification of one litre of water from bacteria. The bromine solution is dropped into the water, to which it gives a slight yellow colour and an unpleasant taste. After being allowed to rest for five minutes both these objectionable qualities are removed by adding a pellet containing sulphite and dried carbonate of soda. The water acted on in this way is found to be comparable to fresh spring water in taste and appearance, and to be absolutely free of living germs. In experimenting with this process Dr. Schumburg found that it acted perfectly with the bacteria of typhoid fever, cholera, diphtheria, &c., and he showed me many Petri dishes, in some of which the culture medium had been inoculated with water from the Spree, and others with the same water after his process had been applied to it. On the former innumerable colonies of bacteria were flourishing, while the latter were completely free of growth of any kind. This would seem to be a very simple method of freeing water from its most dangerous forms of contamination, and one which must prove valuable if, on further trial, all that is claimed for it is shown to be well founded.

On the second day Dr. Krummacher took me to Potsdam, the Versailles of Berlin, where are the Palace and grounds of Sans-Souci, the New Palace, and many other equally magnificent royal residences, as well as the new military hospital, which was the special object of our visit. This hospital has been built quite lately, and has been only a little over two years in occupation. It is intended for the accommodation of the sick of the Potsdam garrison of about 7,000 men, and is capable of containing 350 patients. Potsdam is situated on the Havel, about 16 miles from Berlin, surrounded by most picturesque country, and the hospital has been built within beautifully laid-out and well-wooded grounds.

The principal buildings of the station hospital consist of five blocks, built of red brick and stone-work, and quite separate from each other; the two blocks in front are of one story high, and the three behind are two-storied buildings. The two sets of buildings are in line, and about 100 yards apart, while each block is separated from its neighbour by about 50 yards; the offices of the administration are in one of the former. The medical officer in charge took us round and showed us every portion of the establishment. The (general impression I obtained from the visit was that, so far as I could judge and I carefully examined into every detail), nothing that scientific knowledge, forethought, and ingenuity could devise to make the place suitable for the treatment of sick soldiers had been omitted.

The corridors were asphalted or set in tiles; the staircases to the first floors were wide and lofty, and the stairs of stone steps about 12 feet long. The wards were floored with teak wood, closely set together with no spaces between the boards, which were polished, probably with beeswax, and perfectly bright and clean. Each ward contained 12 iron bedsteads, having wire mattresses, and the cubic space and floor area appeared sufficient for a larger number; the windows, which did not come so close to the floor as is usual in this country, were large and many, giving to the wards a well-lighted and airy appearance; the woodwork was of varnished pine. The bedding and equipment was neat and scrupulously clean; each patient had a bed-side table, somewhat like our own, with shelves. Two systems of artificial heating were available for use in the wards and all over the buildings, and in connexion with them there was a most ingenious mechanism for the prevention of overheating; in each ward hung a thermometer, and when this went above a certain degree an electric bell rang, warning an attendant in charge of the heating apparatus that the supply of hot air or hot water required to be lessened or the ventilation increased. I do not recollect if it gave a similar notice of too low a temperature.

There were water-closets, urinals, and lavatory and bath accommodation on each floor, and the arrangements in this connexion reminded me, so perfect and complete were they, of similar places in a well-appointed London club. There were four baths and four wash-hand basins in each lavatory, with ample supplies of hot and cold water to each, and a shower-bath apparatus to each bath. All these places were free of disagreeable odours. On each floor dining rooms and recreation rooms were provided for patients who could make use of them; they were bright and airy rooms, comfortable and well furnished in every respect.

The operating theatre was very perfect and complete. The floor and the lower six feet of the walls were tiled, the tiles being closely set together without leaving spaces for the accumulation of dust. All the fittings were of iron, glass, and marble, and a hot and cold water supply was available both in in the theatre and in a lavatory off it. German surgeons, for the most part, practice aseptic (as distinguished from antiseptic) surgery; no lotions are applied to a fresh wound, and the dressings used are sterile wools and gauzes, containing no chemical germicides. When, therefore, the officer who was taking us over the hospital saw me looking at a stand of four empty glass vessels, such as we use in this county for antiseptic lotions, he said, "Oh, "that is nothing; those things are obsolete with us." In the German army, too, all the surgical dressings are prepared by the Medical Department, and are, I was assured, of better quality than those of the civil manufacturers.

There was one kitchen for the cooking of the whole establishment, the compactness and economy of space in which were very marked, considering the amount of work required of it. The room was about 16 feet square; there was one cooking range in the centre, about 3½ feet square and 2 feet high, and a hot-plate and three boilers against the wall on one side. It was in perfect order as regards cleanliness, although the cooking was in full work at the time of our inspection. The patients' diets were shown to us, and were of excellent quality, the chicken diets being especially good, and comparing most favourably with some I have seen in similar institutions elsewhere.

The washing of the hospital was done in a steam laundry, which also appeared small for an institution of such a size, but we were assured that it was ample for the work. A rotatory machine and hot-air chambers were used for drying the wet clothes, and a quarter of an hour, we were told, was sufficient for each batch of articles.

The lighting of the hospital was by electricity manufactured on the spot. Two large gas engines worked the dynamos charging, during the day, an extensive system of accumulators, which were worked off during the night in lighting the hospital, and producing enough electricity to illuminate all the lamps for 10 hours.

Two systems of artificial heating were in use, one by hot air, the other by hot water, the latter being on the same principle as that so frequently seen in this country.

The hot-air system was worked as follows:—A fan driven by an engine drew the air from the outside through an asbestos screen into a chamber otherwise air-tight, and forced it through the heating chamber; from there it passed through a tunnel 4 feet high and 2 feet wide, which led to the five main divisions of the hospital. A tunnel of this size was used in order that the circulating pipes of the hot-water apparatus might be placed in it, and be open to inspection and repair when occasion might render this necessary. The air in the exhaust chamber, having passed through the asbestos screen, was stated to be quite free of particles of dust, and, if not free of micro-organisms as well, that the latter were at all events greatly reduced in numbers. Whether these two means of heating are used together, or alternately, I did not ascertain.

This is but a meagre and very imperfect description of a very perfect hospital, and, I fear, will convey but an inadequate idea of the place as we saw it. The medical officer, in showing it to us, made a most thorough inspection of everything, and found everything as it should be. He opened and uncovered all sorts of unexpected places, apparently to look for dirt or dust, but discovered none. He was evidently proud of his hospital, and he had good reason to be so. From one end to the other it was in perfect repair, clean, and orderly; words could hardly give an exaggerated notion of its completeness, it must be seen to be rightly appreciated; to see it is an education in hospital construction and administration.

In conclusion, I must say a word in reference to the hospitality and kindness which every Russian who had anything to do with the Congress, from His Majesty the Tsar downwards, lavished on the foreign members. Some of the more notable of the foreign delegates, Sir William MacCormac amongst others, were lodged and entertained by the Tsar in the palace of the Kremlin; the Russian railways were free to members of the Congress; museums, royal palaces and other places of note and worth inspection were free to members on presentation of their tickets of membership, and excursions and entertainments were organised for every spare hour during the time the Congress lasted. Above all, Professor Skliffosowsky, the President, was indefatigable in his attention to the foreign members, and in efforts to make them happy and contented, and was successful in the performance of a difficult office.

At the last general meeting it was decided to hold the next International Medical Congress at Paris in 1900, under the presidency of M. Lannelongue.

APPENDIX No. IX.

REPORT ON DISORDERED ACTION OF THE HEART AMONG YOUNG SOLDIERS IN INDIA, WITH SUMMARY OF CASES.

By Surgeon-Captain J. B. Wilson, M.D., Army Medical Staff.

Frequency of cardiac affections among soldiers as compared with civilians.

It has long been known that the condition generally described as "palpitation," is very common in the army. In fact, it seems to be agreed that heart diseases of all kinds are much more common among soldiers than in the corresponding classes in civil life.[*] Da Costa in the American army, Frantzel, in the German, and Myers and others in the British, have all written on the subject, pointing out the frequency of organic and functional lesions of the heart among soldiers. The nature and history, too, of these diseases, seem to differ from those of heart diseases among the civil population.

In the first place the most frequent causes of cardiac disease among civilians, viz., acute rheumatism and Bright's disease, do not seem to operate to the same extent among soldiers. Among them the latter cause is conspicuous by its absence, and with regard to the former, I can only say that as far as my limited experience goes, the great majority of the cases which I have seen in the army have not been associated with it.

Secondly, the type of cardiac disease seen among soldiers differs widely from that seen in civil life. All the above-named observers, and others, seem to agree that functional heart disease, or in other words "palpitation," occurs much more frequently among soldiers than any class of organic disease of the heart; probably more frequently than all other forms taken together.

Next to palpitation in order of frequency come dilatation and hypertrophy of the cardiac walls, and the general idea seems to be that the latter conditions are a result of the former, or in other words, that palpitation is not only a serious evil in itself, but that, if unchecked, it will eventually lead to the still more serious organic lesions noted above. It would, therefore, seem that there must be some cause or causes, peculiar to military life, capable of producing in soldiers this disease, from which a corresponding class of civilians are comparatively free. I have endeavoured in this report to collect such facts as have been within my reach, with a view, if possible, of throwing some light on the subject.

Definition and symptoms of the disease. Consciousness of heart's action.

First, with regard to the definition of the disease and its symptoms: Dr. Hilton Fagge[†] defines it as follows:—"In ordinary circumstances and in a "state of health, we are unconscious of the heart's action. If one becomes "aware of its pulsation palpitation is said to be present."

Dr. Burney Yeo[‡] calls it "a consciousness of the heart-beat; an irregular or "forcible action of the heart perceptible to the individual."

In addition to the above subjective symptom there are, in the great majority of cases, the following symptoms, viz., (i.) some alteration in the pulse rate; (ii.) cardiac irritability; (iii.) cardiac pain; and (iv.) various more remote symptoms, such as dyspnœa, "nervousness," sleeplessness, muscular tremors, vertigo, &c., &c.

Tachycardia.

In the recent edition of the official "Nomenclature of Diseases" this affection appears as "disordered action of the heart," and under this heading are included, "bradycardia," or abnormal slowness, and "tachycardia," or abnormal quickness of the heart's action, the latter being further divided into "continuous" and "paroxysmal" varieties.

---

[*] Da Costa, Amer. Journal Med. S.C., 1871. Frantzel, Virchow Archiv., 1873. Myers, "Diseases of Heart among Soldiers," Lond., 1870.

[†] Fagge and Pye Smith, "Principles and Practice of Medicine," 3rd Ed., vol. II., page 11.

[‡] Burney Yeo, "Manual Med. Treatment," 3rd Ed., vol. I., page 365.

Now tachycardia is an almost constant symptom, and in many cases constitutes the main feature of the disease which we are now considering. As a general rule it is of the "continuous" variety, that is the pulse, though very liable to be enormously quickened by trifling causes, stands at a permanently higher rate than normal. It has been laid down that a pulse habitually above 80 is evidence of some diseased condition, and I have seen patients, suffering from palpitation, in whom the pulse never fell below 100, and sometimes even 120, for months. The disease, in fact seems to be a purely functional one (at all events in the early stages), chiefly characterised by rapidity of the heart's action, which is sometimes forcible and tumultuous, but generally weak and with a low tension pulse. It is a very marked feature that the very slightest exertion or disturbance, mental or physical, even the exertion of rising to the erect position, or sitting up in bed, will send the pulse rate up to 120, 140, or even 160, in some of these cases; hence in all probability the term of "irritable heart" which has been applied to the disease by Da Costa.

Cardiac irritability.

Cardiac pain.

Another very constant symptom is cardiac pain. It is generally this which leads the soldier to present himself at hospital. He complains of a constant pain in the left side radiating into the left arm or left hypochondrium.

Recapitulation of symptoms.

The above symptoms, therefore, in the absence of any organic lesion of the heart, constitute the diagnostic features of the disease. To recapitulate, they are consciousness of the heart's action, tachycardia, cardiac irritability, and cardiac pain. Besides these there are other symptoms which affect the sufferers. There are dyspnœa on exertion, vertigo, and giddiness on parade, nervousness, muscular tremors, and inability to sleep, the patient waking in a fright once or more every night.

Anæmia is frequently associated with palpitation, but perhaps more frequently as a cause than a consequence. This point will be referred to later on. The disease seems, in many cases, to be associated with a condition of extreme nervousness. I have frequently observed patients under examination to be the subjects of choræic movements of one hand or foot, and to be quite unable to keep perfectly still. I have seen them reduced to such a nervous condition as to burst into tears when questioned about some trifling matter in the history of the disease. This was not from any feeling of annoyance, as the men themselves have assured me, but merely from a temporary loss of nervous control. Whether the cardiac lesion is the result of this condition of nervous irritability or its cause, or whether they both own a common cause, I am not in a position to decide.

From the above short description of the symptoms, it will, I think, be clear that a man suffering from this condition is quite unfit for the duties of a soldier, and as a matter of fact, I may venture to say that it is well known to medical officers that such men do much to swell the lists of sick in hospitals. They are incapable of fatiguing duties, of long marches, even of parades and gymnastic exercises. They are absolutely unfit for active service. They remain for long periods in hospital, for the disease is a most intractable one to treat. In India, as a general rule, they are eventually invalided for change to England.

Absolute frequency of the disease among soldiers.

With regard to the absolute frequency of this affection among soldiers generally, it is very difficult to come to a just conclusion for several reasons. Firstly, the disease under consideration is included, together with all other diseases of the circulatory system, under one heading in the general returns of the sick of the army. Secondly, a large number of men in hospital returned as suffering from other diseases, such as anæmia, debility, bronchitis, &c., &c., are found to be the subjects of this disease. Men are invalided to England under other headings, such as the above, who are also suffering from a marked degree of palpitation. Hence much of the disease is overlooked from a statistical point of view. However, even allowing for these sources of error, I think it can be shown that heart disease in general, and palpitations in particular, are responsible for a large share in the sickness, and especially in the invaliding of troops, both at home and in India.

Thus, taking the figures given in the Army Medical Reports for the years 1886 to 1893, I find that among the troops in the United Kingdom and in

India, or in other words four-fifths of the British army, for every 1,000 of strength the average annual number of men constantly sick is 1·05, and the average annual number of invalids is 4·4 from diseases of the circulatory system only. It is worthy of note that the number of invalids from this cause is more than twice as great as that from any other, not even excluding syphilis.

Of course, these figures refer to all diseases of the circulatory system taken together; and it is, as I have already shown, impossible to state to what extent, they are due to palpitation, and to what extent to the other diseases coming under this head.

Comparison between palpitation and other diseases of the circulatory system.

I have made a calculation, however, which may throw some light on this part of the question, from the annual returns of sick, for ten years, of one station hospital in India, viz., Cawnpore. Of course the numbers are too small to base any theory on, but they may serve as some indication of the relative proportion borne by palpitation to the other diseases under this head. I found, that taking the returns for ten years, there was an average annual strength of 692 men. From diseases of the circulatory system the average annual number constantly sick was 0·87, of which 0·55, or nearly two-thirds, suffered from palpitation only, and the remaining 0·32 from all other diseases of the circulatory system taken together. The average annual number of invalids from palpitation was 0·7, and that from other diseases of the circulatory system was 2·1. In considering this last fact, however, it must be borne in mind that, as I have stated above, a large number of men are invalided each year suffering from palpitation who are returned under other headings, such as debility, &c. Taking all the above considerations into account, I think it will be admitted as highly probable that more men are invalided each year from the army directly or indirectly on account of palpitation than from any one other cause whatever.

Ætiology.

As I have already pointed out, it would seem from the above facts and figures that there must be some cause or causes peculiar to the soldier's life which render him much more liable to this complaint than civilians of a similar grade.

Now first to take what I call the classical causes of the disease, viz., those which are usually assigned in text books of medicine and in current medical literature. As far as I have been able to gather these are as follows: I. Dyspepsia and flatulence. II. The abuse of alcohol. III. Sexual excess, including masturbation. IV. The abuse of tobacco (or tea). V. Anæmia, or the exhausted condition produced by malarious or other fevers, or by secondary syphilis. VI. Over-exertion of any kind and emotional mental disturbances. VII. "Any cause which diminishes blood pressure by dilating the small "arteries, and lessening the obstruction the heart normally has to overcome," such as exposure to excessive heat in tropical climates, &c. Alcoholic intoxication also comes under this head.

On looking over the above list it will be obvious that the greater number of the above causes are common alike to the soldier and the civilian. Hence it becomes necessary, in order to explain the greatly increased incidence of the disease on soldiers, either to look for other causes or to assume that those already mentioned have, for some reason or other, a greater effect on soldiers than on civilians. I believe that the truth is to be found in both these ways, or in other words, that there are other causes at work, and also that the causes already mentioned do act to a greater extent on soldiers than on men in civil life.

Causes peculiar to the soldier.

The special causes which have been advanced to explain this disease as peculiar to soldiers, have, as far as I am aware, been two. It has been attributed (1) to the tight stock, belts, accoutrements, and tunic and knapsack worn by the soldier, and (2) to "setting-up drill."

Tight accoutrements.

Now with regard to the first cause: it may have been, and probably was, operative in causing a certain amount of the disease in former times, but practically speaking it exists no longer. The stock and the knapsack are things of the past. Men do gymnastics and physical drill in their shirts and trousers only. The serge frock is worn on most drills, parades, and marches. Of course the valise equipment with its cross-belts is still carried on home service, but in India, where I write, men march and drill in khaki, and their valises are carried for them. As I have pointed out above there is no means of finding out from statistics what, if any, decrease has taken place in the number of admissions from palpitation since these changes have been carried out. But one thing is quite certain, viz., that tight accoutrements, such as stocks and knapsacks, could not have been the only cause, for although they have been discontinued, the disease still persists.

Setting-up drill.

Coming now to the second cause, viz., setting-up drill, I would refer to a paper in the Army Medical Department Reports for 1876, by Surgeon F. A. Davy, M.D.* The author here shows, to my mind conclusively, the injurious effect on the recruit of the position of forced inspiration which he is compelled to assume in order to "dilate his chest" during the drill. It is stated that if men are examined while undergoing this drill that a large number of them will be found to be suffering from palpitation; the heart acting about 110 times per minute and irregularly. The reason for this is stated to be that the "act of expiration "being to a great extent in abeyance" in the "dilated chest" position, it must follow that considerable obstruction is offered to the pulmonary circulation. The chest being dilated and kept at the position of forced inspiration, greatly increased tension in the air vesicles is the result. As the contained air is not changed by free expiration, it becomes loaded with carbon dioxide; the diffusion of gases can no longer take place between the blood in the pulmonary capillaries and the air in the vesicles; and obstruction to the circulation, with great embarrassment of the right ventricle, takes place. The left ventricle is also placed at a disadvantage, inasmuch as a smaller supply of blood reaches it through the embarrassed lungs. Hence it contracts quickly, and probably irregularly, in order to keep up the circulation; and the rhythm between the two sides of the heart is upset, the result being palpitation. Such is the argument contained in this most interesting paper, and to my mind it is irresistible.

In connexion with this part of the subject I may mention that only on one occasion have I have had an opportunity of performing a post-mortem examination on the body of a man who had to my knowledge suffered from palpitation during life. He died of acute phthisis. On examining the heart I found that while the aortic orifice was normal and the valves competent, as tested by their capacity for closing the ventricle against a stream of water poured into the aortic opening, the pulmonary orifice was slightly dilated and the pulmonary valves incompetent, allowing water readily through into the right ventricle. There were no vegetations on any of the valves and absolutely no other sign of cardiac disease. No murmur could ever be detected during life. Of course, in this case the post-mortem appearance may have been a mere coincidence. Still it seems worthy of note that the appearances were exactly what one would expect to find after a prolonged course of obstruction to the pulmonary circulation, such as Surgeon Davy has shown to be produced by setting-up drill. Nevertheless when we turn to the actual cases of palpitation as they seek admission to hospital, it does not appear that the men themselves, as a rule, attribute their disease to the immediate effects of setting-up drill.

In a paper on this subject in the Army Medical Reports for 1880, Brigade-Surgeon Veale, M.D.,† gives an analysis of 100 cases of this disease who had arrived at Netley as invalids. The disease is here ascribed by him to no less than 17 different causes for 100 cases. Hilton Fagge,‡ in commenting upon this statement, considers that it is much more likely that some one cause is really responsible, and that probably the true solution has been found by Surgeon F. A. Davy, who refers it mainly to the setting-up drill in the paper quoted above.

The truth seems to be that the setting-up drill commences the disease in such an insidious manner that the men do not notice it at the time. When dismissed the drill, probably men of strong physique recover altogether. In those who are weaker, or who afterwards are subjected to any of the causes enumerated above, the disease persists and advances so as to force itself on the attention of the sufferer and eventually unfit him for his duty. My reasons for making this statement are the following: Although the cases of the disease which I have seen did not, as a rule, directly attribute their disease to setting-up drill, yet I have almost invariably found that they had been at one time or other subjected to severe drill of this kind or to its equivalent in some other form of hard labour, performed under the same mechanical disadvantage to the circulation of the dilated chest position. One cause which I consider the exact equivalent of setting-up drill, inasmuch as it requires the same position of dilated chest and forced inspiration for considerable lengths of time, is playing wind instruments. Now, it is well known that bandsmen who play on wind instruments are much more liable to palpitation than other soldiers. Brigade-Surgeon Veale, in his 100 cases quoted above, gives five as resulting from this cause, and in about 23 cases which I have been able to collect, and of which an abstract is attached to this paper, two were undoubtedly caused in this manner. It is a most suggestive circumstance that we have here the condition which has been described by Surgeon Davy as taking place in "setting-up drill" exactly reproduced.

---

* Davy, Army Med. Dept. Report XVIII. † Veale, Army Med. Dept. Report XXII.
‡ Fagge, Op. cit., page 20, vol. II.

I have also observed that the disease is much more common in corps where the work is hard, and the standard of drill high; where recruits drills are more frequent and severe, and the regiment unusually "smart" and well drilled on parade, than in others in which drills are not so frequent and exacting. As an example of this I may give the case of two regiments at the same station in successive years. The strengths were about the same, and other conditions were as nearly as possible identical. The first regiment, which was not, as far as I am aware, remarkable for any unusual severity of drill, or proficiency on parade beyond the average, from an average annual strength of 833 in one year furnished only two admissions to hospital for palpitation. In the following year their place was taken by a regiment with a reputation for "smartness" on parade and excellence in drill. They had taken prizes at various assaults-at-arms for physical drill and bayonet exercise. Their average annual strength was 867, and during the year 15 men were admitted from their ranks for palpitation. I may mention that the same medical officer was in charge of the station hospital during the whole two years, and the same system of nomenclature in diagnosis of disease was adopted.

From the above facts, I think it will be admitted, as at all events highly probable, that setting-up drill or its equivalent is the starting point or predisposing cause of this disease in most cases among soldiers, and that it is probably chiefly to blame for the increased prevalence of the disease among them as compared with civilians.

But it is also evident that other causes come into play in exciting the disease among young soldiers, particularly in India. In order to consider these I shall take them seriatim as noted above.

Dyspepsia and flatulence.

Dyspepsia and flatulence.—I believe this cause to be comparatively rare among soldiers, though it is said to be common amongst factory and mill workers and others in large towns in England, who are placed under bad conditions both as regards food and general hygiene, and who suffer from what is called tea dyspepsia. The young soldier does not as a rule suffer from dyspepsia. I have, however, seen one case in which a man suffered both from dyspepsia and palpitation, the latter probably the result of the former, which in its turn was probably caused by the total absence of teeth in his upper jaw.

The abuse of alcohol.

The abuse of alcohol.—I have not been able to trace many cases directly to this cause. Of 21 cases noted by me 14 were men who according to their own account were either teetotalers or did not exceed two pints of beer per day. From other inquiries I believe these men's statements to be correct. The remaining 7 men would probably be classed as more or less intemperate, they admitted to drinking from 3 to 7 pints of beer each daily, in fact all that they could get.

Sexual excess.

Sexual excess.—It is difficult to ascertain whether or not cases are due to this cause. But I have made inquiries in all cases which have come before me, and I am convinced that the men who suffer from palpitation indulge neither more nor less than their comrades, and I do not consider that the disease is in any way attributable to this cause except indirectly in those cases in which men have acquired secondary syphilis.

The abuse of tobacco or tea.

The abuse of tobacco has been alluded to by Professor Veale. I believe this to be a very important exciting cause of the disease among soldiers. There is no doubt that the canteen "plug" tobacco ordinarily supplied to the soldier, and smoked as he does it perhaps in a clay pipe before breakfast, often induces palpitation, especially in the young recruit. In fact I have proved it to be capable of inducing an experimental attack in men who are accustomed to smoke daily a fair quantity of cigars or of tobacco of a milder brand. This I have ascertained from observations in my own person and in that of a brother officer.

Anæmia and malarial and other fevers, and secondary syphilis.

The connection between palpitation and anæmia is apparently a very intimate one. In 14 of 21 cases noted by me, the patients were markedly anæmic. Palpitation and dyspnœa are stated by most writers on the subject to be two prominent symptoms of the more severe forms of anæmia. The palpitation, however, found in cases of anæmia, is generally of a paroxysmal and transitory nature, quite different from the irritable heart of the soldier. However, the presence and the marked degree of anæmia in most cases of palpitation seen among young soldiers are sufficient evidence of the intimate connection of the two conditions, although it is sometimes difficult to tell from the clinical history of the case which was the original disease. Malarial and other exhausting fevers, and more particularly secondary syphilis, often lead up to palpitation through the marked anæmia they produce. In these cases the sequence of events can be clearly established. I have now before me the case of a very intelligent man who was invalided to England suffering from severe palpitation. The history of the case revealed nothing likely to cause the disease until he contracted syphilis. The secondary symptoms were of a severe and protracted nature, and induced profound anæmia. He was 114 days in hospital, and towards the close of his period he began to suffer from the cardiac symptoms which ultimately led to his being invalided home.

From a theoretical point of view the connection between anæmia and palpitation is easily explained. The arterial tension in anæmia is low. Now, Lauder Brunton has shown in his experiments upon animals that there is a constant inverse relation between arterial tension and pulse-rate; or, in other words, that as the arterial tension falls, the pulse rate rises.* He says: "In "the normal condition of an animal, when all the nerves are intact, a rise in "blood pressure renders the pulse slow by increasing the normal tone of the "vagus centre in the medulla, and a fall of pressure quickens the pulse by "diminishing the tone."

Influence of tropical heat.

This would account for the influence of anæmia on the cardiac action. It also probably accounts for another very important factor in the production of palpitation in the young soldier in India, namely, exposure to excessive heat. It is, of course, a well-known fact that such exposure produces a well-marked lowering of blood pressure by the great dilatation which is caused in the capillaries and arterioles of the skin. That this fall in blood pressure is accompanied by a striking rise in the pulse-rate is a clinical fact which I have frequently observed. While noting cases of palpitation in the hot weather in India, I have frequently made comparisons between their pulse-rate and that of men in hospital who were not suffering from any cardiac disease. I chose men who were practically in good health as far as their circulation was concerned, such as cases of trifling injury, primary syphilis, &c. who, although obliged to be in hospital, were not in a very debilitated condition. I was surprised to find, that when these observations were made in the hot months, most of the cases had a pulse rate of from 90 to 100 or over per minute. I attribute this to the fall in blood pressure caused by the excessive heat, and partly by the general loss of "tone" caused by the season, the two causes taken together leading to a considerable fall from the normal blood pressure for the individual and the physiological rise in pulse-rate, in accordance with Lauder Brunton's rule. I may add, as confirmative of these observations, that any considerable fall in temperature of the air was invariably followed by a reduction in the pulse-rate of these patients. I think it is therefore plain that the prolonged action of heat, which leads to lowered blood pressure by dilatation of the arterioles and capillaries of the skin and also by general lowering of muscular "tone" and thus produces the compensating "tachycardia," is a very important factor in the exciting and the keeping up of cardiac palpitation, particularly when taken in conjunction with the other causes to which the young soldier in India is liable.

---

* Lauder Brunton, "Pharmacology and Therapeutics," 3rd Ed., sec. 1, p. 272 *et seq.*

Ætiology recapitulation.

I may here mention that I consider the number of cases observed by me to be far too few to warrant definite conclusions as to this important and complicated subject. But I consider that one or two facts are clearly established.

In endeavouring to find out the causation of any disease two factors must be taken into consideration: (1) The nature of the injury or irritation presented to the organism; and (2) the resistance which the latter is capable of offering.

From consideration of the causes of palpitation set forth above it will be observed that all men serving as soldiers in India are about equally exposed to them. Hence it follows that those who succumb are less capable of resistance than their fellows. I regret that I have not noted the proportion of special enlistments among my cases of palpitation, but I have been struck with the general poorness of physique, small chest measurement, and indications of struma among many of the men suffering from this disease. It most undoubtedly picks out the weak men, those who have been under-fed in youth, and who have either barely passed the recruiting standard, or who have been accepted as special enlistments, and have been unable to withstand the strain of a soldier's life. These men are predisposed to cardiac failure in the form of palpitation, and many of them succumb to it.

The special exciting causes I have detailed above; the peculiar strain of setting-up drill as at present carried out, or the still more severe one of playing wind instruments in a band, when followed by the depressing effect of hot seasons in the plains of India, the anæmia of malarious fevers and of secondary syphilis, and the injurious effects of beer, and especially of the soldiers' strong tobacco, are, as far as I have discovered, the causes of this disease, and although others may perhaps be discovered on further investigation into this most interesting subject, yet I think the above are amply sufficient to account for it, and will in fact ultimately be found to be mainly or wholly responsible.

Treatment.

With regard to the treatment of this affection there is unfortunately not much to be said. To quote the celebrated aphorism of John Hunter, "the " first and great requisite for the restoration of injured parts is rest." Rest is the essential factor in the treatment of these cases. The medical officer in India can rarely follow his cases to a termination as they are usually sent to the hills or invalided to England. However, cases which are taken into hospital, and relieved from the strain of every-day duty, as well as prevented from indulging in beer or tobacco, slowly, but steadily, improve. Provided that no organic changes have already taken place in the heart these cases would, no doubt, ultimately recover completely.

Digitalis.

The drug which seems to be recommended by most authorities in these cases is digitalis. From its well-known physiological effect on the heart it might be expected to effect rapid improvement. I have not found this to be the case. But if it is given in considerable doses, for long periods, and its effects carefully watched, it will be seen to produce a steady improvement both in the rate and regularity of the pulse. If the use of digitalis is omitted for a time during treatment under these circumstances, a relapse of the tachycardia will generally be observed. The fact is that the disease, once set up, is exceedingly chronic in its course. Should treatment be commenced before organic changes have begun in the heart, and should the man be allowed perfect rest and invalided at the first opportunity to England, he will probably recover completely. If, however, this is not done the injury to the heart is probably permanent. In either case the man is lost to the service, either altogether or for a considerable length of time at the best, and this emphasizes the fact which I wish to point out, viz., that prevention in these cases is very much better than cure.

Prevention.

With regard to this point, I will only venture to say that I think it comes under two heads viz., (1.) The selection of the recruit, and (2.) His treatment after selection.

As to the selection of the recruit I will merely repeat what I have already said, that, in cases I have observed, the disease almost invariably occurred in men of poor physique, who only just come up to the lowest prescribed standard or who had been accepted as special enlistments. Many of them were men of slight "weedy" frame, who showed signs of imperfect development, probably from under-feeding in youth. Some, from the appearance of the bones and the teeth, showed signs of having suffered from rickets or struma in childhood. It therefore seems to me that were these men not enlisted, the prevalence of palpitation in the army would be very much diminished. With regard to the management of recruits after enlistment, I would once more refer to Surgeon F. A. Davy's paper quoted above, in which he shows the injurious effects of "setting-up drill," as at present conducted, on the heart of a recruit. In fact, if I may do so, I would point out the close analogy existing between the recruit and the young horse in training. In the case of the latter, the trainer first gets the animal fat; then he trains it in slow work to "put on muscle," and it is not until the animal is thoroughly "fit" that he attempts "fast work." He is never allowed to become distressed by his gallops, nor to overtax his respiratory or circulatory powers. Probably the total amount of work done by the recruit is not excessive, if calculated in foot-tons per day. But it is the distribution of the work that tries him. Instead of the continuous slow work of the labourer or artizan, he has long intervals of rest and short spells of severe exertion, which, in the case of recruits' drill, he is obliged to carry out in a constrained position, placing his circulatory system at a marked disadvantage. The recruit on enlistment, from his previous habits of life, is often not in sufficiently good physical condition to withstand this strain. He is at an age when growth and development are making great demands on his strength, and often the amount and quality of food which he has been able to obtain have not been such as to supply those demands. He therefore requires the same line of treatment as the colt, viz., slow work and good feeding, until he has been able to put on flesh. Afterwards, like the colt, he may be gradually brought into "fast work" such as drills, military training, gymnastics, physical drill, &c. with the best possible results. Somewhat closer medical supervision during the earlier period of his career might help in attaining this object.

I have observed that men who are suffering from palpitation, or who have a tendency in that direction, take a much longer time to recover normal pulse-rate after exercise than healthy men. For example, a healthy man has a pulse-rate, say, of about 68 per minute. He goes through Sandow's light dumb-bell exercises (which are now generally adopted in military gymnasia). Immediately after, his pulse-rate is probably 110; after five minutes, it will be 140; after 10 minutes 95; after 15 minutes, 90; after half an hour, 80, and in one hour probably normal again. Contrast this with the case of a man suffering from slight palpitation who had been in hospital some time and was improving, although he still suffered from slight tachycardia. He was told to walk about 50 yards, and then slowly double about the same distance, a very trifling exertion indeed compared even with Sandow's light dumb-bell drill. Pulse before starting 92; 10 minutes after 128; one hour after, 144; the same evening, 108, and the following morning, 104. The difference here is sufficiently marked to emphasise the point to which I wish to draw attention, viz., that it is the length of time taken to recover the normal pulse after exercise which differentiates the healthy heart from that which is suffering from overstrain. Consequently it is obvious that it is comparatively useless for purposes of diagnosis to take the pulses of a gymnasium class of recruits immediately at the close of the exercise. They will probably then be all acting at a nearly uniform rate (of about 120 per minute). But if they are taken at intervals of half an hour for some hours after, more men can easily be picked out who are suffering from cardiac strain. Even if circumstances do not permit of this being done, it would probably be much better to examine men, say, one hour after gymnasium or drill, because by that time all the healthy ones would have a normal pulse rate, and only those suffering from cardiac strain would be accelerated. In this way, men likely to break down might be put on a lighter or slower scale of work, and supervised more carefully, and thus entirely saved from becoming victims of a disease which, if developed, would entirely prevent their ever being of service to the State as effective soldiers.

VING THE FACTS ASCERTAINED WITH REFERENCE

Rank and Name.	acco.	Place and Date of noting the Case.	Remarks.
Gunner H. B., R.H.A.	moderate	Meerut, October 11, 1891.	Very anæmic.
Private J. B., R.I.F.	er	Meerut, September 15, 1891.	
Private R. S., R.I.F.	moker	Meerut, September 26, 1891.	
Bombardier P., R.A.	moker	Meerut, October 7, 1891.	
Bombardier H. W R.H.A.	rate; 1 oz. acco per	Meerut, September 6, 1891.	
Private D., 5th Lancer	rate	Meerut, October 14, 1891.	
Private L., R.I.F.	r	Allahabad, July 9, 1895.	Invalided to England.
Private McC., R.I.F.	r	Allahabad, June 22, 1895.	Invalided to England.
Private D., R.I.F.	moker	Allahabad, July 9, 1895.	Invalided to England.
Gunner D., 54 F.B.R.A	half sticks n tobacco	Allahabad.	
Corporal P., 54 F.B.R.A	canteen er week.	Allahabad, January 15, 1896.	Has had rheumatic fever. Slight murmur with first sound of heart. Slight chorea.
Private W., 2 H.L.I.	smoker; tobacco him.	Cawnpore, November 10, 1896.	Had phlebitis of saphenous vein, left foot. Improved under iron and digitalis. Invalided to England.
Private C., 2 H.L.I.	moderate one pipe	Cawnpore, January 7, 1897.	Invalided to England.
Private S., 2 H.L.I.	canteen in nine	Cawnpore, February 10, 1897.	Invalided to England.
Private C., 2 H.L.I.	tobacco	Cawnpore, February 22, 1897.	Improved considerably with rest and treatment. Now on furlough in the hills.
Private S., 2 H.L.I.	tobacco s.	Cawnpore February 7, 1897.	Improved very much. Discharged to go to the hills after six weeks' very careful treatment.
Private K., 2 H.L.I.	tobacco s.	Cawnpore, February 25, 1897.	Discharged after two months' treatment. Improved, but still suffering from tachycardia Two months' furlough.
Private M., 2 H.L.I.	tobacco s.	Cawnpore, February 25, 1897.	Died of acute miliary tubercle. In this case pulmonary valve found to be slightly incompetent. *See* page 428.
Private K., 2 H.L.I.	-	Cawnpore, February 24, 1897.	Sent to hills. An attempt will be made to arrange for artificial teeth.
Private N., 2 H.L.I.	smoker;	Cawnpore, March 10, 1897.	

APPENDIX No. X.

ON THE EFFICACY OF INVALIDING IN THE TREATMENT OF MEDITERRANEAN FEVER.

By Surgeon-Captain H. D. Rowan, M.B., Army Medical Staff.

Although it is a very old established custom to transfer men suffering from Mediterranean fever to England, there appear to be but few records of the effect of such change upon the individual; that is to say, that when a case of this fever has been invalided to England, those who were responsible for his transfer have, hitherto, seldom heard anything more of the case. In very few instances have they learnt how long the man was under treatment after his transfer or what was the effect of the change upon the liability to relapse. Whether the winter at home has an invigorating action and the summer a relaxing effect on Mediterranean fever, or whether the former retards, and the latter hastens, convalescence, is still a moot point.

Seldom has information been available to determine how far a case is prejudiced by protracted detention in Malta, or aggravated by premature transfer, and a comparison has seldom been made between the respective advantages of treatment at the Station Hospitals, the local sanatorium, or at home.

A reference to the Annual Reports of the Army Medical Department for the last 40 years makes it evident that either the value of change to England has not been appreciated or that the facilities of transport have been wholly insufficient. Between 1859 and 1879 only ·4 of the annual admissions for simple continued fever were invalided. In 1872 there were 1133 admissions, of whom only 2 were invalided.

Between 1879 and 1896 the extent of invaliding for simple continued fever has been as follows:—

——	Annual Percentage of Admissions.
1879–83	·5
1884–88	1·5
1889–93	5·3
1894	2·4
1895	3·0
1896	*5·8

* Cottonera Hospital only.

In view of this record of the extent to which invaliding has been practised in Malta it is not surprising that the references to the subject by Medical Officers have been exceedingly meagre; in the Army Medical Department Annual for 1861, at the conclusion of a report upon the fever of Malta, Assistant Surgeon J. A. Marston, R.A., wrote: "Should the anæmia be great "and the splenic volume remain increased, then one of two things will cure, "change of air from the Mediterranean or the approach of the cold wintry "weather."

In the annual for 1865, Surgeon J. S. Chartres, 100th Regiment, mentions "change of air away from the morbid district" as a remedy.

In the annual for 1862 favourable mention is made of the sanatorium, Citta Vecchia, as suitable for cases of Mediterranean fever which would otherwise have had to be invalided home.

These are the only three references to the value of change as a remedy for Malta fever contained in the Army Medical Department's annual reports during the last forty years; there seems, indeed, to have been a conspiracy of silence upon this subject of invaliding, which to me is inexplicable. It would be intelligible were there a good alternative to invaliding, but the only alternative, that of hospital treatment in Malta, has little to commend it.

In proof of the inefficacy of the local hospital treatment of Mediterranean fever, I will briefly state the result of my own experience, and I venture to say that the large majority of those who have taken an active part in the treatment of this disease will concur in my remarks. The medicinal treatment of Mediterranean fever has, hitherto, been eminently unsatisfactory. Various remedies have at different times been vaunted as specifics, only to be discredited or altogether discarded after a brief season of popularity. The present medicinal treatment is almost entirely symptomatic. Nursing, dieting, and the relief of symptoms are doubtless of the utmost importance, but even with their most careful and skilful application the disease is frequently very protracted, and the fever pursues a long and monotonous course which seems interminable alike to medical officer and patient. Day by day, often for weeks or months together, the patient's interest in life appears to be concentrated on his temperature chart. There is no finality about this fever; seldom can we predict its duration, and we seem powerless to check its course.

Concerning its possible duration, Surgeon-Captain D. Bruce, A.M.S., writes:—"Soldiers show an average stay in hospital of nearly 90 days, while "some return to duty after twenty or thirty days, others again remain in "hospital as many weeks or more. One case which came under my "observation was admitted in July, and, with the exception of February "and March, he was in hospital suffering from this fever and its sequelæ "until the end of the following year." (Hygiene and Diseases of Warm Climates, p. 271.)

I admit that change of climate is not a certain and speedy cure, and that convalescence is often protracted, and relapses are not uncommon after leaving Malta, but as an adjunct, and a very valuable adjunct, to the treatment of Mediterranean fever, invaliding, I contend, has not hitherto received that attention which it deserves. I propose, therefore, in the following pages, to discuss the effects of invaliding upon patients whom I have had under my immediate care, in the hope that by so doing I may be able to furnish sufficient proof that the interests alike of the sick and of the State are best consulted by the early invaliding of cases of Mediterranean fever.

All the cases treated of in this thesis came under my immediate care in the special ward, Cottonera Hospital, between September 1894 and September 1896; of nearly all of them I have notes, taken while under treatment, and from my personal knowledge of each case, more especially of the more serious ones, I am, naturally, in a position to form a tolerably just estimate of the value of climatic change upon the individual and upon the series taken collectively. So far as I was responsible for the disposal of these cases the system of invaliding adopted was that usually followed in the island. How far this system might be modified with advantage will, I hope, appear in the following analysis of the results obtained.

Explanatory.—1. Until the present year "Mediterranean Fever" was included in the term "simple continued fever," a term which comprised a host of cases due to other causes than those peculiar to the Mediterranean. In order to make a practical distinction between what is now known as Mediterranean fever and "simple continued fever," no case of simple continued fever which had not been at least 14 days in hospital has been regarded as one of Mediterranean fever.

2. The term Mediterranean fever as hereafter used refers only to the type of the disease met with in Malta.

3. The present series of 228 cases constitutes probably about two-thirds of all the admissions in Cottonera Hospital for Mediterranean fever between September 1894 and September 1896, and it comprises the whole of the serious cases admitted during that period.

4. I am indebted to the kindly co-operation of the medical officers of the Sanatorium, Citta Vecchia, of the Royal Victoria Hospital, Netley, and of the Herbert Hospital, Woolwich, for the information relative to the ultimate disposal of my patients. To follow these patients from one hospital to another in Malta, to the Sanatorium, and to England, where they remained in hospital or were sent on furlough, has been a task of some difficulty and has involved others besides myself in a good deal of correspondence. The information requested was in all instances very promptly supplied, but in order not to trespass too much on the good offices of others I only asked for the time and mode of disposal of the cases, and not for clinical details. My record is therefore to this extent imperfect.

5. A few remarks have been added relative to the cases of officers who were treated by me in Cottonera Hospital during the last two years, and invalided thence to England.

6. The thesis has been divided into the following sections :—

Section I. Total amount of inefficiency.
Section II. Cases returned to duty.
Section III. Cases sent to the Sanatorium, Citta Vecchia.
Section IV. Cases invalided to England.
Section V. Cases finally invalided from the service.
Section VI. Deaths.
Section VII. Cases of officers invalided to England.
Section VIII. Summary and conclusions.

TABLE I.—SUMMARY OF SERIES.

A. Total Number of Cases, 228.

Disposal.	Number.	Average duration in Hospital (Malta).
To Duty - - -	110	30 Days.
To Sanatorium - -	59	36 „
To England - -	51	84 „
Died - - -	8	31 „

B. Of those sent to the Sanatorium.

Disposal.	Number.	Average Duration in Days.				
		In Hospital at Malta.	At Sanatorium.	At Sea.	At Home.	Total.
To Duty - -	54	38	43	—	—	81
To England - -	5	62	83	10	?	155*

* Before arrival home.

C. Of those sent to England Direct.

Disposal.	Number.	Average duration in Days.			Total Inefficiency
		In Hospital at Malta.	At Sea.	Under Treatment in England.	
					Days.
To Duty - -	35	81	10	84	175
Invalided - -	3	99	10	85	194
Remaining in Hospital.	1	34	10	127	171
No record - -	12	96	10	?	?

D. Officers.

Year.	Number.	Duration in Hospital, Malta.	Period of Sick Leave.
1895 - - -	9	50 days	4 months.
1896 - - -	2	75 „	3½ „ (Exclusive of extensions.)

Section I.—Total amount of inefficiency.—Of the cases tabulated 199 returned to duty after an average inefficiency per man of 59 days; 3 were eventually invalided from the service after having been under treatment 194 days (average); 16 were under treatment in Malta previous to their embarkation 125 days (average), their ultimate disposal being unknown, and one remained in hospital at the end of the year 1896, after an interval of 71 days. Taking all these facts into consideration, the average amount of inefficiency of these cases is not adequately represented by less tthan 70 days.

High as this average is, it compares favourably with the figures quoted by Surgeon-Captain Bruce, who states that in 1886, of 91 cases the average stay in hospital was 85·5 days, and again in 1887, of 109 cases " there were 4 deaths, " 9 were invalided, and the remainder showed the long average stay in " hospital of 82 days." Had he included the duration under treatment of the cases invalided, the average inefficiency of the cases recorded would certainly have exceeded 100 days. This represents an enormous amount of inefficiency, incalculable so far as the health of the invalids is concerned, and a heavy burden to the state when regarded from a pecuniary point of view.

Section II.—Cases returned to duty.—Number of cases, 110. Average duration in hospital, 30 days.

There were 8 of these cases under treatment for more than six weeks; one was in hospital 101 days suffering from irregular remittent or intermittent fever; of another it is recorded that he had fever for 12 days, and subsequently a relapse lasting 30 days, remaining in hospital 71 days; a third case was in hospital 72 days with irregular fever and rheumatism. The cases in this section call for no further comment; the large majority of them were mild cases of Mediterranean fever, having pyrexia of from 6 to 14 days duration. Under the recently adopted nomenclature many of these cases would probably not have been regarded as cases of Mediterranean fever, the pyrexia being so slight. The average duration in hospital of these cases is, I think, unduly prolonged by retaining some of them for periods of 60, 70, 80, or 100 days. Some of the cases which had fever of from 20 to 40 days duration would probably have done better had they been invalided, while many of those who suffered from anæmia and debility would probably have made a more speedy convalescence at the sanatorium.

TABLE II.—CASES TRANSFERRED TO CITTA VECCHIA, THENCE RETURNED TO DUTY.

Number of Case.	Date of Admission.	Number of Days in Hospital.	Number of Days at Citta Vecchia.	Total.
	1894.			
1	31 December -	23	34	57
2	26 November -	51	27	78
3	„	82	70	152
4	31 December -	16	41	57
	1895.			
5	4 January - -	14	27	41
6	4 „ - -	19	50	69
7	27 „ -	13	27	40
8	21 „ -	9	20	29
9	3 February -	27	21	48
10	1 March - -	33	55	88
11	23 „ - -	39	21	60
12	5 April - -	33	84	117
13	24 „ - -	42	63	105
14	1 May - -	63	21	84
15	14 „ - -	29	21	50
16	19 „ - -	23	70	93
17	20 „ - -	65	84	149
18	21 „ - -	50	56	106
19	28 „ - -	22	21	43
20	3 June - -	99	37	136
21	11 „ - -	44	21	65
22	14 „ - -	40	28	68
23	28 „ - -	40	35	75
24	6 July - -	65	50	115
25	3 „ - -	27	38	65
26	24 „ - -	55	43	98
27	25 „ - -	26	21	47
28	28 August - -	49	21	70
29	26 „ - -	23	14	37
30	10 September -	56*	16	72
31	14 „ -	11	13	24
32	7 October - -	29*	21	50
33	14 „ - -	23	13	36
34	25 „ - -	12	13	25
	1896.			
35	18 March - -	97	45	142
36	„ - -	97	80	177
37	23 May - -	30	30	60
38	2 June - -	21	74	95
39	„ - -	28	36	64
40	4 „ - -	19	104	123
41	11 „ - -	19	13	32
42	3 July - -	18	41	59
43	5 „ - -	16	82	98
44	11 „ - -	31	40	71
45	21 „ - -	49	34	83
46	29 „ - -	27	61	88
47	5 August - -	34	48	82
48	12 „ - -	62	34	96
49	15 „ - -	46	52	98
50	24 „ - -	58	19	77
51	26 „ - -	69	21	90
52	2 September -	20	41	61
53	3 „ -	19	74	93
54	5 „ -	38	39	77

* 23 days in Valletta Hospital.

Section III.—Cases sent to the Sanatorium.—This sanatorium was established in 1860 by Mr. Sydney Herbert when Secretary of State for War. It occupies the old palace of justice at Citta Vecchia, is 770 ft. above sea level, is distant 9 miles from Cottonera Hospital, and has accommodation for 80 patients.

There were 59 men sent to the sanatorium; the average stay of these cases in hospital prior to their transfer was 36 days, the length of stay of the individual cases being given in Table II. There were two cases in hospital 97 days each, characterised by fever lasting 4 or 5 days a week, one was inefficient altogether 142 days, the other 177 days; both cases might have been sent home with advantage.

Among other instances of long detention in hospital were case No. 3, in hospital 82 days, duration of pyrexia only 27 days; case No. 20, in hospital 99 days, admitted in a typhoid condition, 50 days fever. This man seems to have made a good recovery at the sanatorium, where he only remained 37 days, but as a general rule such cases should, I think, be invalided rather than sent to the sanatorium in the month of August; case No. 24, in hospital 65 days, 51 days fever, was detained 15 days in consequence of a relapse; case No. 26 was also detained 14 days in consequence of the recurrence of fever on the eve of his proposed transfer.

In accordance with an established rule the cases sent to the sanatorium were free from fever at the time of their actual transfer; this principle might be extended with advantage, so that no case should be transferred who has not been at least 10 days free from fever.

Of the 59 cases sent to Citta Vecchia 54 returned to duty after an average of 43 days at the sanatorium, and 5 were invalided after having been at the sanatorium 83 days (average). Taking into consideration the fact that all these cases were, at the time of their leaving Cottonera Hospital, enjoying a period of apyrexia, an average stay of 43 days at the sanatorium is sufficient proof that the change did not prevent relapses. The period at the sanatorium varied from 13 to 104 days. As a rule, men who had had fever lasting 30 days or more previous to transfer did not do well. Examples:

Number of Case.	Period in Hospital.	Duration of Pyrexia.	Period at Sanatorium.
13 - -	42 days - -	30 days - -	63 days.
18 - -	50 „ - -	40 „ - -	56 „
24 - -	65 „ - -	50 „ - -	50 „
35 - -	97 „ - -	60 „ - -	45 „
36 -	97 „ - -	62 „ - -	80 „

Of the 5 cases who were sent to the sanatorium and thence to England (*see* Table III,), the average duration of their treatment in Malta was 145 days. It would have been better to have invalided such cases direct to England or to have sent them home, say, four or five weeks after their arrival at Citta Vecchia.

TABLE III.—CASES TRANSFERRED TO CITTA VECCHIA, THENCE TO ENGLAND.

Number of Case.	Date of Admission.	Number of Days under Treatment				Total.
		In Hospital.	At Citta Vecchia.	At Sea.	In England.	
55 - -	April 5 -	79 + 54	83	10	?	226 (before arrival home.)
56 - -	May 10 -	44 + 8	83	10	?	145 „
57 - -	„ 26 -	28 + 54	83	10	?	175 „
58 - -	June 14 -	58	86	10	12	166 „
59 - -	„ 28 -	30	45	10	?	85 (before arrival home.)

Case No. 57 exemplifies the difficulty of making a prognosis in individual cases of Mediterranean fever. At the time of his transfer, only 28 days after his admission, this man appeared to be almost convalescent, and yet after the lapse of another 83 days it was necessary to invalid him to England. Two cases (55 and 57) were detained in Malta 54 days each after passing an invaliding board, awaiting a passage home. I have no particulars of the history of these cases during their stay at the sanatorium, but I subjoin an extract from the annual report (1896) of the medical officer in charge which will serve to show what is the value of the sanatorium in the treatment of Mediterranean fever.

"The results of my observations since I have been in charge confirm what I see is noted in some of the previous annual reports, that the really convalescent are those that derive most benefit from the change, as residence here does not seem to cut short the fever, and does not prevent relapses, though these are, however, less likely to occur. When, however, convalescence is once fully established patients do very well indeed, and the progress made is in many instances remarkable, as is evidenced by a marked and steady increase in weight."

Convalescence cannot be said to be fully established in severe cases until several weeks after their temperature has become normal, and as it is not desirable that they should remain this time in hospital such cases should be invalided home. On the other hand, mild cases, which have had continuous fever up to 15 or 20 days or intermittent fever up to 30 days, seem to be suitable for change to the sanatorium in the hot weather, provided that at the time of their transfer they have not had fever for at least a week or ten days.

In the case of boys the debilitating effects of this fever are so marked that they should be sent out of the island as early as possible; for example, Case No. 43, admitted 5th July 1896, had fever only 14 days, but this had already induced extreme anæmia; he was sent to the sanatorium 21st July, where he remained nearly three months.

TABLE IV.—CASES INVALIDED TO ENGLAND DIRECT.

Disposal.	Number.	Average Duration under Treatment in England.	Average Total Inefficiency.
To duty - - -	35	84 days - -	175 days.
Invalided - - -	3	- - - - -	104 „
Remaining in hospital -	1	- - - - -	171 „
Uncertain - - -	12	(Under treatment in Malta before embarkation, average 96 days.)	

TABLE V.—CASES INVALIDED DIRECT TO ENGLAND THENCE RETURNED TO DUTY.

Number of Case.	Date of Admission.	Number of Days under Treatment			Number of Days on Furlough.	Total.
		In Hospital at Malta.	At Sea.	In Hospital in England.		
	1895.					
60	March 20 -	45	10	70	—	125
61	„ 25 -	75	10	35	—	120
62	April 2 -	67	10	26	—	103
63	May 12 -	115	10	86	—	211
64	„ 17 -	110	10	8	—	128
65	August 15 -	103	10	14	—	127
66	„ 16 -	67	10	24	—	101
67	November 13	194	10	49	—	253
68	December 14	95	10	21	—	126
	1896.					
69	January 22 -	55	10	25	—	91
70	„ 29 -	123	10	36	—	169
71	February 22 -	93	10	160	—	263
72	„ 29 -	87	10	92	—	189
73	March 8 -	79	10	58	—	147
74	„ 4 -	83	10	63	—	156
75	„ 5 -	82	10	37	61	190
76	„ 11 -	76	10	54	91	231
77	„ 21 -	66	10	70	—	146
78	April 4 - -	109	10	81	—	200
79	„ 19 -	72	10	85	—	167
80	„ 21 -	71	10	78	67	226
81	„ 27 -	63	10	156	—	229
82	May 6 - -	117	10	37	62	226
83	„ 20 -	62	10	46	61	179
84	„ 23 -	87	10	113	61	271
85	„ 26 -	62	10	51	64	187
86	June 23 -	61	10	12	93	176
87	„ 10 -	69	10	24	74	177
88	„ 16 -	80	10	22	62	174
89	„ 15 -	81	10	32	63	186
90	„ 30 -	55	10	19	74	158
91	July 2 - -	53	10	19	74	156
92	„ 8 - -	47	10	125	—	182
93	„ 16 -	38	10	12	71	131
94	„ 27 -	58	10	41	61	170

TABLE VI.—INVALIDS CONCERNING WHOM NO NOTIFICATION OF THEIR ULTIMATE DISPOSAL HAD BEEN RECEIVED UP TO 31ST DECEMBER 1896.

Number of Case.	Date of Admission.	Days under Treatment.		
		In Hospital at Malta.	At Sea.	At Home.
95	April 22	199	10	Not known.
96	May 26	62	10	„
97	June 25	135	10	„
98	„	135	10	„
99	July 16	69	10	„
100	„ 24	61	10	„
101	„ 28	98	10	„
102	August 14	85	10	„
103	„ 18	77	10	„
104	„ 21	74	10	„
105	„ 24	71	10	„
106	„ 14	85	10	„

The Cases 95, 97, 98, 102, and 106 are referred to in Table X.

Section IV.—Cases invalided to England.—There were 51 cases invalided to England direct; their stay in hospital in Malta varied between 38 and 194 days; the average was 84 days.

For the disposal of these cases *see* Tables I., IV., and V. The duration in hospital of many of these men was unduly prolonged by the necessity of awaiting transport home, but apart from this these cases, generally speaking, seem to me to have been detained too long in Malta. The only justification for detaining cases of Mediterranean fever in Malta is the hope that they will make a good recovery in the course of the cold weather; this hope I believe to be in the majority of cases a delusive one. The following are cases in point:—

In Case No. 67, fever of undulant type, of 3½ months' duration, was not benefited in the least by the cold weather of the months of December, January, and February. Case No. 68 had continuous fever during December, January, and February. Case No. 70 was admitted in January; in hospital 123 days (awaiting passage home 75 days) with fever, marked debility, and very painful rheumatism; there was absolutely no improvement in his general health up to the time of his departure from the island in May. Case No. 76 was admitted in March; in hospital, 76 days; the fever persisted with a remarkable absence of any subjective symptoms from the day of his admission to that of his embarkation. Case No. 78 admitted April 4; in hospital, 109 days; this was little else than a record of temperature. There was never a period of complete apyrexia. Case No. 74, admitted April 4; in hospital, 83 days; there was little or no improvement while in Malta.

Case No. 71, admitted Feb. 22, in hospital, 93 days; case No. 72, admitted Feb. 29, in hospital, 87 days; and case No. 75, admitted March 5, in hospital, 82 days. These three cases are grouped together because they were reported sick about the same time, from the same barrack, and on admission to hospital they all had the symptoms of profound septic intoxication. In hospital they suffered from persistent fever and profuse sweats, congestion of the lungs, and epistaxis. Two of them were not benefited in the least by the climate of March and April.

Their subsequent course was contrary to what might have been anticipated. Case No. 75, the most severe, made a good recovery, going on furlough about a month after his arrival home. Case No. 71, on the other hand, who had

had only 22 days' fever, and had improved considerably before leaving Malta in May, was 160 days in hospital in England before he was fit for duty, furnishing another example of the difficulties of prognosis.

Severe cases of Mediterranean fever are not common between October and April; but my experience has been that when such cases do occur it is not desirable to detain them in Malta, trusting to the supposed invigorating effect of the cold weather; at the best their convalescence is slow, and they hamper the hospitals.

With regard to cases occurring at the end of the cold weather or during the hot weather, there surely can be no doubt of the advisability of their being sent home early.

Such cases as the following were, I think, detained too long in Malta:—Case No. 63, admitted in May, in hospital, 115 days; the acute symptoms had subsided after the first 40 days. Case No. 64, admitted in May, in hospital, 110 days; the fever was of 60 days' duration. Case 107 (Table VII.), admitted in June, in hospital, 110 days. After his arrival home the disease was changed to tubercle of lung, for which he was invalided from the service; there was no suspicion of his having tubercle until shortly before he left Malta. Such a case is not very uncommon where an attack of Mediterranean fever seems to determine the development of tubercle. It is possible that had this man gone home earlier the tubercle might have remained latent. Case No. 88, admitted June, in hospital, 80 days; the fever was of 70 days' duration. Case No. 89, admitted in June, in hospital, 81 days; the predominant symptom was extreme anæmia. Case No. 101, admitted in July; in hospital, 98 days. There was fever up to the day of embarkation, accompanied by extreme anæmia and emaciation. Case No. 65, admitted in August; in hospital 103 days with persistent fever and anæmia. Case No. 82, admitted in May, in hospital, 117 days; necessarily detained 75 days on account of his mental condition. This was a severe case of fever, followed by acute mania. For four days and four nights the ceaseless efforts of two orderlies were required to keep this man in bed. Case No. 85, admitted in May, in hospital, 62 days; a very severe case; during one relapse he was for five days unconscious. This lad was admitted into hospital with fat, rosy cheeks, and left it a poor, sickly-faced boy, robbed of all courage and energy.

Of 35 cases invalided direct to England who subsequently returned to duty, and of whom I have a record of their final disposal, the average inefficiency per man after arrival in England was 84 days.

This includes the time spent in hospital and on furlough.

If these periods be separated the result is as follows:—

Of 20 cases in hospital until fit for duty, the average duration in hospital was 64 days.

Of 15 cases in hospital and subsequently granted furlough, the average duration in hospital was 40 days and the average length of furlough 70 days.

The following facts seem to indicate that other considerations than the actual state of health of the men determined the granting of furlough, as of 15 cases sent to Netley only 2 were granted furlough, while of 20 cases sent to Woolwich 13 went on furlough. Of the first 20 cases sent home only 2 went on furlough, but of the other 15 cases 13 were granted furlough. The amount of furlough was usually two months. It is obviously an advantage when convalescence is sufficiently established to grant furlough; a man who has been many weeks or months in hospital naturally desires, and surely deserves, an opportunity of seeing his people at home and of spending a few weeks' holiday free from the irksome restraint and depressing surroundings of a hospital. It is also in the interests of the service that the hospitals should not be burdened any longer than is absolutely necessary with sick.

I regret that I have no clinical details of these cases after their departure from Malta, but, taking into consideration the severity of their symptoms before leaving Malta, and judging of their subsequent progress by the number of days they were in hospital or on furlough, I think it will be admitted that, generally speaking, the effect of change to England was very beneficial.

The following cases, in particular, are illustrative of the good effects of invaliding:—

Number of Case.	Number of Days.	
	In Hospital in England.	On Furlough.
62	26	—
64*	8	—
65*	14	—
66	24	—
68*	21	—
69	25	—
70*	36	—
86*	12	93
87	24	74
90	19	74
88*	22	62

* The clinical history of these cases has already been referred to.

There were four men who were in hospital more than 100 days after arrival in England: one of these (case 92) was only 47 days in hospital in Malta; his was a particularly severe case, and he was invalided earlier than is usual as it was feared that another relapse in Malta would be fatal.

An average of 84 days of inefficiency after arrival in England may not at first appear to be a very favourable result, but to appreciate at its real value the benefit derived by these cases from change to England it must be noted that:—

1. The time actually in hospital (about 60 days) was not high, and might probably have been shortened had there been a more uniform system of granting furlough.
2. All these 35 cases were severe cases; more than half of them had at one time or another been on the "serious" list during their stay at Cottonera Hospital.
3. Left to themselves, that is to say, left in Malta, the course of such cases is often interminable (on this point *see* previous remarks).

Section V., Cases finally invalided from the Service.—Of the three cases finally unfit for the service mention has already been made of one (case No. 107) who developed tubercle of the lung, the other two cases were unfitted for the service simply and solely by the effects of Mediterranean fever. Both suffered from extreme anæmia, one case (No. 109) being in hospital in Malta 130 days (practically the whole cold weather); in addition to the anæmia he suffered from irregular fever and very painful rheumatism. His was a case which, I feel sure, was aggravated by a protracted stay in Malta.

TABLE VII.—CASES FINALLY INVALIDED FROM THE SERVICE.

Number of Case.	Date of Admission.	Number of Days under Treatment.			Total.
		In Hospital at Malta.	At Sea.	In Hospital in England.	
107	June 6, 1895 -	110	10	88	208
108	April 12, 1896 -	57	10	112	179
109	January 17, 1896	130	10	56	196

Section VI., Deaths.—There were eight deaths. These cases call for but little comment here, as with one exception they proved fatal within two or three weeks of admission. One man died 89 days after admission from exhaustion, the post-mortem revealing extensive ulceration of the large intestine; this man had two relapses before the fatal one, and it is just possible that his life might have been saved had he been sent home at the end of the sixth or seventh week after admission. At any rate the possibility of the second, third, or fourth relapse terminating in death seems to me an additional argument for losing no time in sending a severe case home.

There was one case remaining under treatment at the end of 1896, *see* Table VIII. The most marked symptom in this case was that of extreme anæmia, which was exceptionally severe.

TABLE VIII.—CASES REMAINING UNDER TREATMENT, 31ST DECEMBER 1896.

Number of Case.	Date of Admission.	Number of Days under Treatment.			
		In Hospital at Malta.	At Sea.	In Hospital in England.	Total.
110	July 13, 1896 -	34	10	127	171

Section VII.—Cases of Officers invalided to England.—This table has been added for comparison with corresponding tables relating to the men.

TABLE IX.—INVALIDING OF OFFICERS.

Year.	Officers Invalided.	Average Duration in Hospital.	Average Sick Leave.
1895	9	50 days.	4 months.
1896	2	75 „	8¼ „

The average duration in hospital of officers is considerably less than that of the men, but while none of the latter received more than two or three months furlough, the average sick leave of the former (excluding extensions) was about four months.

All these were severe cases; that is to say, that at the time of their embarkation (with one exception) they were suffering from fever, were very debilitated, and had not arrived at that stage when they could be allowed solid food. The following particulars with regard to their progress after arrival in England has been obtained from the officers themselves.

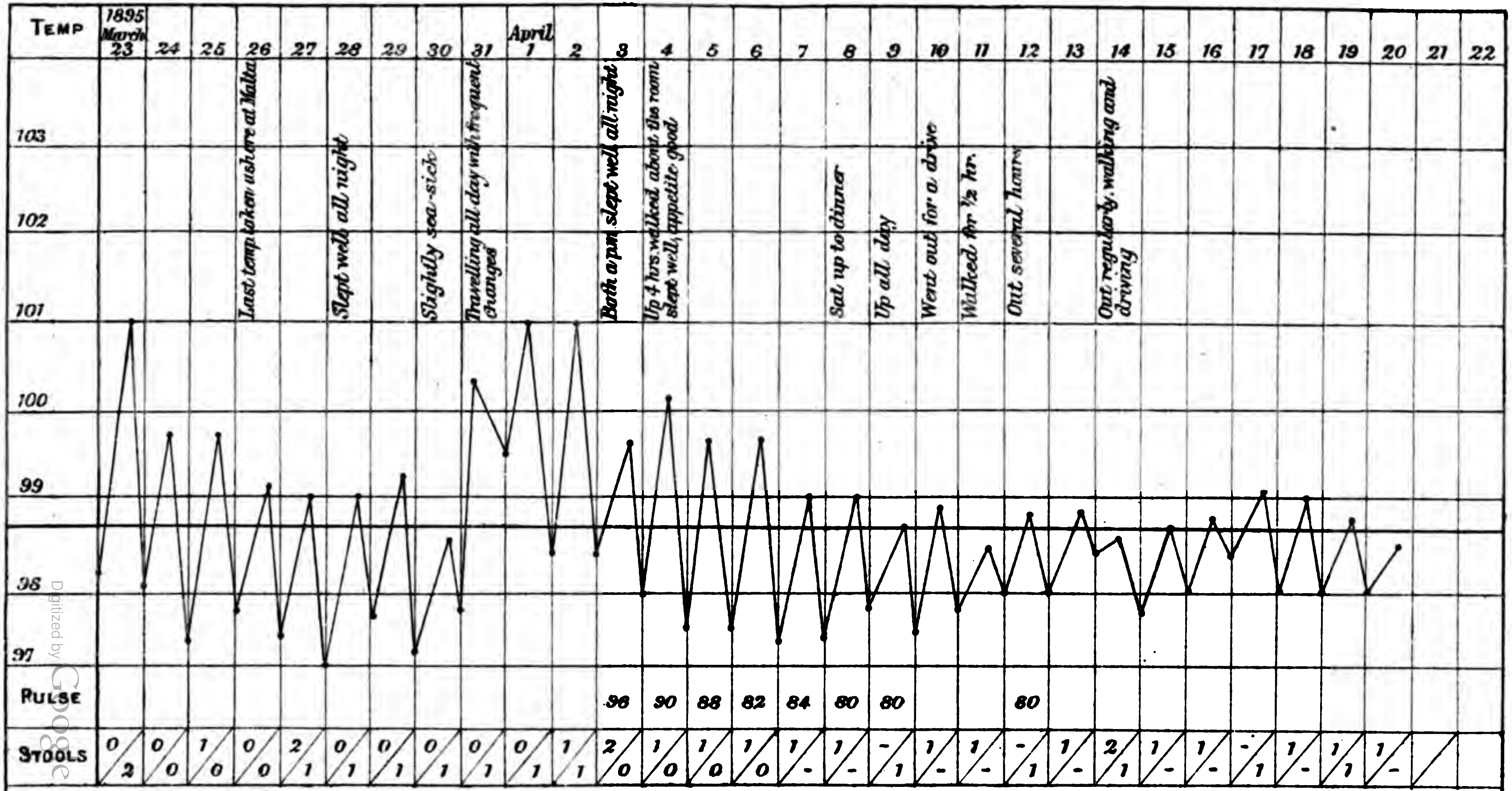
Captain M. was in bed for six or eight weeks, then made a rapid convalescence.

Surgeon-Major T., a very severe case. Suffered from fever for several months and was granted an extension of leave.

Major K., had little or no fever after arrival in England.

Lieutentant B. was invalided to his home in Australia. His case was complicated with lung mischief suspected to be tubercular; he was granted six months' leave and made a good recovery.

CASE OF LIEUT. M- (NOTES RECORDED BY HIS FATHER)



Left Malta 4 p.m. 26th March for Genoa via Syracuse & Naples, Arrived 31st 7 a.m. Left Genoa 12·30 p.m. for Mentone, Arrived 6.30 p.m. Began to eat light food on board - Has ordinary meals since arrival at Mentone, No stimulants.

Wyman & Sons Ltd Lith. 3974·12·97

Surgeon-Captain B. had fever at home for a month or six weeks.

Lieutenant M. was a particularly severe case. He was in hospital in Malta 64 days, during which time the fever was continuous with very slight morning remissions, and his condition on leaving the island was so critical that his father obtained the services of a medical officer to accompany him to the Riviera. The temperature chart of this officer after his departure from Malta was conscientiously recorded by his father, and is given as an illustration of the good effect that may accrue from change.

Surgeon-Captain H.* was in hospital about two months, during which the evening temperature seldom exceeded 100°, a very favourable issue was anticipated, instead of which this officer was confined to bed for several months after arrival in England suffering from high fever and rheumatism.

Lieutenant B. was invalided after a month's stay in hospital, his convalescence was protracted by an attack of orchitis.

The other two cases were quite convalescent after the sea voyage and a fortnight or three weeks at home.

Personally, I suffered from fever accompanied by very painful rheumatism continuously for a month, at the expiration of which time I went home on leave, and was quite free from rheumatism and practically convalescent before landing at Portsmouth.

Transport of Invalids.—Up to the beginning of 1896 the usual method of sending men home was to have an occasional invaliding board and there to await a public opportunity for transport, or if there was too great an accumulation of invalids a ship was specially chartered for their conveyance.

Early in 1896 Surgeon-Major-General Maunsell instituted the system of monthly boards. Of the invalids who pass these boards the ordinary cases await a public opportunity to go home, the others, for whom in the opinion of the board "immediate change is absolutely necessary," are sent to England by the first succeeding ship carrying a surgeon, usually a "P. and O." ship.

This system is, I believe, as effective a one as can be adopted under the circumstances. It not only provides facilities for immediate change when considered necessary, but it prevents the overcrowding of our hospitals in Malta. The system might be extended with advantage by making it a standing order that no man who has been invalided should be kept waiting for a public passage longer than a certain time, say, a month, as at present those cases for which at the time of their being invalided immediate change was not considered "absolutely necessary" remain in Malta sometimes for several months afterwards.

It seems to be that, apart from any consideration for the invalid, the expense to the State of providing private passages for such cases as those recorded in Table X. would have been less than that entailed by their long stay in hospital.

TABLE X.—INVALIDS DETAINED IN MALTA AWAITING PASSAGE HOME.

Number of Case.	Date of Invaliding Board.	Date of Embarkation.	Period of Waiting.
95	30th June 1896 -	7th Nov. 1896 -	139 days.
97	22nd July 1896 -	" -	107 "
98	17th August 1896	" -	82 "
102	" -	" -	82 "
106	" -	" -	82 "

---

* This officer is still unfit for duty, seven months after his departure from Malta.

Of these men cases 95, 97, and 98 were almost convalescent before leaving Malta, while others had made but little improvement; so far as one can judge, it is most probable that in all the cases recovery would have been very much more rapid had they gone home at the time of their invaliding.

There is one other point to be noted with regard to the actual transport of cases of "Mediterranean" fever. The accommodation, nursing, and food at present obtainable on board ship are seldom suitable to the requirements of the sick. On board the ordinary military transport the accommodation and food is usually defective, while on a private ship the provision made for nursing and medical supervision is only for a small number of sick.

If cases of "Mediterranean" fever are to be sent home early, as I believe they should be, it must necessarily follow that at the time of their embarkation most of them will be lying-down cases, quite unable to help themselves and in urgent need of the most careful nursing and attention to diet. Very marked benefit may reasonably be expected from a sea voyage, but not so long as the invalids are cooped up in closely confined cabins. On one occasion when proceeding to England in medical charge of some 60 invalids, most of whom were cases of this fever, I remarked how those who were sufficiently convalescent to get about the decks were benefited by the voyage home, they improved in colour, they acquired a hearty appetite and put on weight, and were almost fit for duty by the time we arrived at Southampton; on the other hand, those who were confined in the dark, ill-ventilated hospital were on arrival home in the same sorry plight that they had been on coming on board; the sea voyage, so far from having had a beneficial effect, seemed to have aggravated their sufferings.

Summary.—1. The subject of invaliding cases of Mediterranean fever has not received that attention which its importance demands.

2. Much more information than we possess at present is desirable.

3. For the accumulation of facts and the compilation of statistics there are two essentials:—

(*a.*) The diagnosis should be exact.

(*b.*) There should be continuity of medical records of individual cases from their original admission until their final disposal.

(*a.*) Question of diagnosis.—Hitherto statistics have been vitiated by including under one name (that of simple continued fever) cases due to many different causes. Now that Mediterranean fever has been dignified by a place in the recent nomenclature of diseases, we are, for the first time, in a position to collect many valuable facts with regard to this disease, its prevalence in time and place, and the amount of inefficiency it causes, and the value of preventive and curative measures ought in future to be estimated with accuracy and precision.

(*b.*) Continuity of medical records—This is a very important matter. There should be a complete clinical history of each case from start to finish, so that the medical officer who was responsible for his invaliding might know how his patient fared after his departure from Malta. From the information thus acquired he would learn which are the most suitable cases for invaliding, and at what stage of the disease and at what time of the year they should be sent home.

4. As cases of Mediterranean fever are now diagnosed as such, I would suggest that some method be adopted by which the medical officers who invalid men suffering from this disease could be made acquainted with the salient points of their cases after their departure from Malta. This information could be recorded on some such return as the detailed medical history sheet, a copy of which should be sent on the final disposal of the case to the hospital from which the man was invalided. Amongst other salient points which might be recorded are the following:—How the patient bore the journey; the effect of the sea voyage; the effect of the English winter; liability to bronchitis, &c.; duration and character of fever; liability to relapses; occurrence of rheumatism, orchitis, boils, &c.; development of tubercle; persistence of anæmia, &c.

Such a return would not entail any great increase of clerical labour, and would, I feel sure, supply much valuable information which at present is unprocurable.

5. Pending the accumulation of further evidence, I will proceed, with very great diffidence, to formulate certain conclusions derived from the series of cases recorded in this thesis and from my experience generally of Malta fever.

The disposal of a case of this fever is usually determined by the character and duration of the temperature, modified by the circumstances of each individual case, by the season of the year, and the facilities for transport. For example:—

Duration of continuous pyrexia, three weeks.—The case will probably do very well in hospital. In the summer he might be sent to the sanatorium after the lapse of a week or ten days' pyrexia.

Duration of continuous pyrexia, four weeks.—In the cold weather can be disposed of as above; in the summer months a man who has had 28 days of continuous fever should be sent home.

Duration of continuous pyrexia, five weeks.—Even in the cold weather it is desirable that such cases should be sent home.

I would put 40 days of continuous pyrexia as the limit, after which a case of Mediterranean fever should not be kept in Malta.

Where the fever is irregularly intermittent, and there is no marked deterioration of the general health, a case may be detained as long as 60 days in Malta in the hot weather, or 80 days in the winter. Whatever may be their behaviour in England, we know that these cases are sometimes almost interminable in Malta; therefore these periods should be the limits of expectancy.

No time should be lost in sending home cases of fever accompanied by extreme anæmia. If the preceding fever has not been protracted, and there is no liability to relapses, cases of ordinary anæmia do very well at the sanatorium.

Boys should be sent home earlier than grown men.

Influence of season.—The hot weather of Malta lasts from May to October (inclusive); fever is most prevalent in June and July, but September and October, when the scirocco is most prevalent, are the most trying months for invalids. So far as possible severe cases of fever should not be allowed to remain in Malta during those months.

Influence of stage of disease.—Provided that the transport is suitable, a case of Mediterranean fever may safely be embarked at almost any stage of his illness. Where there is a tendency to relapses it is sometimes advisable to send a man home immediately he is fit to travel in order to anticipate another, and perhaps fatal, recurrence of hyperpyrexia.

Chronic rheumatism is usually accompanied by anæmia, and both appear to be manifestations of the same form of blood deterioration. The indications for invaliding are those already given for anæmia.

Facilities of transport.—Much unnecessary delay in sending men home is caused by the want of suitable transport. Invalids often accumulate in consequence of there being no ships at all available for their transport, or serious cases are not sent home because the accommodation on board military transports or P. and O. ships is not suitable for their wants.

I believe that it would be a great saving to the State, as well as an enormous benefit to our invalids, were a properly equipped hospital ship to ply to and from the Mediterranean during the summer months. It is in the summer that transport is most urgently needed, and when it is with the greatest difficulty procurable. Such a ship should have roomy, well-lighted, and well-ventilated wards with confortable conveniently placed cots (not all arranged in tiers). Fresh meat and fresh milk should be supplied, and special attention should be paid to the subject of invalid cooking. Every facility should be provided to enable the sick to come on deck and enjoy the sea breezes.

The advantages of such an hospital ship would be:—1. That men invalided would not be kept in Malta awaiting a passage. 2. That cases could be sent home at an earlier stage of the disease. 3. That cases would derive considerable benefit from the sea voyage.

APPENDIX No. XI.

MARCHING AND ITS PLACE IN THE TRAINING OF THE SOLDIER.

By Surgeon-Captian H. W. Austin, Army Medical Staff.

Introductory.

It has been laid down as an axiom that the soldier who cannot shoot is useless and an incumbrance to his battalion, and incontestably the same might be said with even a greater degree of truth as regards the soldier who cannot march; for whereas the former may conceivably find himself in a position where accuracy of aim would be unnecessary, the man unable to keep with his comrades is not only an incumbrance, but may become in an enemy's country a positive source of danger.

It is somewhat strange that the question of the systematic training of the soldier in this most important—perhaps the most important—part of the military curriculum, has, until within very recent years met with but little attention at the hands of the authorities. The very large number of men who fell out during the New Forest manœuvres of 1895, amounting in the case of the Aldershot division alone to 835, first brought prominently to notice the very serious defects in training under which the army laboured, and pointed to the absolute necessity for the fullest inquiry into their cause with a view to remedial measures being applied.

The result of this inquiry was the institution of a system of training in marching, commencing with comparatively short distances, gradually increasing in length and culminating in a consecutive six days' march during which the battalion would cover between 80 and 100 miles. Provision was also made for lightening the load to be carried by immature lads and weakly men. While the idea has much to commend it, it has been found in practice that the climatic conditions in some parts of the country militate to a considerable extent against the system being carried out in its integrity. Very little consideration will show that, while a march of 20 miles in the clear frosty air and hard roads of Scotland and the north of England need not only entail little hardship, but to the soldier who has been gradually habituated to it, be eminently enjoyable, the same distance in the drizzling rain and heavy muddy roads peculiar to the south-west of England and Ireland during the winter months, would be trying in the extreme.

As in the battles of the future celerity of movement will be a more potent factor for success than has probably ever been the case, and the rapidity with which troops are concentrated in a given point may decide the result, not only of an engagement but of a campaign, it is incumbent on us to carefully study every circumstance bearing on the marching powers of our soldiers, and to leave no stone unturned by which their mobility may be brought to the highest effective point. But not only is it essential that they should be able to march for a considerable distance (say, 20 miles) in campaigning order; it is a desideratum that they should be able to do so without undue fatigue; that not only should they be able to take part in an engagement, but should, in the event of the necessity arising, have sufficient latent energy to take part in a pursuit. Napoleon has been credited with the dictum that the secret of war lies in being able to march 10 leagues, fight a battle, and march 10 leagues afterwards. If this were true of his day, it is even truer of our own.

A recent writer has endeavoured to show that invidious comparisons between the marching powers of our home army and those of the soldiers of the continent are erroneous, inasmuch, as, he argues, the troops in Great Britain and Ireland by no means comprise the "British Army." The force of his argument is, however, difficult to see, when we consider that in the event of our being drawn into an European War, the troops in India would be required for the defence of that country, and our dependence would have to be placed on the small number which could be detached from our Colonial garrisons, and on that very home army which he thinks should not be considered. But, it may be objected, the young troops of our home battalions would only form the nucleus of the fighting force, the ranks would be filled with the trained and mature soldiers of the reserve—granted, but what training in marching have these reserve men had? Practically none. It must also be borne in mind that it was precisely those troops who, under ordinary circumstances, would be the first for active service, the troops of the 1st Army Corps, who broke down so miserably on the occasion of the manœuvres to which I have referred.

If in comparing the marching powers of our soldiers with those of the continental troops, we honestly face the question, and in the event of our finding those of any other nation superior to our own, we endeavour to trace the cause of their superiority instead of trying to explain it away, we may glean much valuable information and confer a lasting benefit alike on the army and the State.

We find the French infantry man, though infinitely inferior in physique to our own, covering 25 miles without difficulty, though burdened with impedimenta much in excess of that carried by his English *confrère*. During the recent manœuvres in Hungary, the Honved troops marched even greater distances under extremely unfavourable circumstances. Indeed, it may be taken that, generally speaking, 20 to 25 miles in marching order is, on the continent, by no means considered a very notable undertaking.

The inferior stamina of our recruits has been attributed by more than one writer to the poor feeding and hardship generally of many of the class from which the majority of our soldiers are obtained. This argument is good till we begin to look into it by the light of comparison, when we see its fallacy, for surely no sane person with a knowledge of the facts would contend that our lower classes are worse housed and fed than those of the large towns of Germany and Austria, that our country applicant for the Queen's uniform has not enjoyed very considerable advantages over the polenta-eating Italian, or that even at the worst, his sustenance and environment have not been superior to those of the French *paysan* with his inevitable onion soup.

The fault must then, I think, be looked for elsewhere, and it is with the view of ascertaining how far the shortcomings in the marching capabilities of our soldiers are due to preventable causes, and how these causes can be removed, and the marching powers of the men developed to the fullest extent, that this paper is written.

Disabilities incidental to Marching.—These may be roughly divided into two heads: footsoreness and exhaustion; and arising as they do from altogether different causes, it is necessary that they should be separately considered, for the case may be easily supposed of a strong man being perfectly incapacitated from continuing a march simply through the tenderness of his feet, while in all other respects quite able to continue prolonged exertion without undue fatigue.

Foot soreness.

Leaving out of account men who suffer from some abnormal condition of feet, almost every case of excessive footsoreness might be traced to one of two causes: defective or badly-fitting boots and socks, and want of cleanliness. Volumes might be written on the subject of the soldiers' foot-covering without exhausting the question. Experiments innumerable have been made in this and other countries with the view of evolving a boot, which shall satisfy all the various conditions demanded of so important a portion of his equipment, but without any very marked result—indeed the perfect military boot has yet to be invented. The English boot with all its defects, and they are many, compares favourably with any boot worn by continental troops. An inspection of the heavy, clumsy, high boot of the Russian infantryman and the hardly less unwieldy "wellington" of the German, excites feelings of wonder, not only that the men march as well so they do, but that they manage to march at all. The British infantry boot has been generally condemned on the ground of hardness, want of elasticity in the sole, and excessive weight. The hardness of the upper is, in my opinion, in a great measure due to improper treatment, for when the boot is first issued this part is both soft and flexible. I have examined a large number of boots after they have been some time in wear, and have invariably found that every consideration of comfort has been sacrificed to the one desideratum in the mind of the soldier—a high degree of polish. To so great a height is this carried by some men that they actually beeswax and bone their boots, with the result that they have the brilliancy of glass and about as much flexibility. If company officers were careful to see that the men's second pair of boots were kept thoroughly dubbed, and the men were instructed that an occasional rub of castor oil, while keeping the boots beautifully soft, in no way interfered with the polish, we would probably hear less complaints on the subject of hardness. Certain it is that if a boot were made of Russia leather it would be ruined by the present method of treatment.

The cast-iron stiffness of the sole and the weight are two points demanding serious consideration. The boots used by the troops during the Ashanti expedition of 1895–96 are spoken well of by Surgeon-Major-General Taylor, A.M.S. This officer reports:—"the boots were of excellent pattern and there was very little footsoreness." These were probably hand-made ammunition boots, than which it is impossible to get anything better; a fact vouched by many officers who habitually use them for shooting boots. It is probable also that they had not been subjected to the hardening process to which I have referred.

A serious defect in the pattern of the present service boot is the shape of the toe, which constricts the front part of the foot. In this respect the somewhat exaggerated square toe of the Germans is infinitely preferable.

The present pattern of seamless sock is very good, but the utmost supervision on the part of officers is required to ensure these articles being at all times in good condition. It may be said with absolute truth that no article in a soldier's kit, after his boots, is of such importance. Given the most perfect boots in the world, if a man has a hole in his socks his feet will inevitably be blistered; and in this connexion I may observe that the rough and ready darning usually given these articles is almost as bad as holes. To those who can accustom themselves to it, the greased wrapper or *fuszläppen* is probably for this reason better adapted for campaigning than the woollen sock. It is worthy of note that the French alpine troops prefer a well-greased foot in a well greased boot to any form of foot covering.

In intimate connexion with the boot comes the gaiter, and here we have absolute unanimity of condemnation. It presses on the instep and heel, causing galling and blisters, and while serving no useful purpose, is ugly in itself and destructive to the trousers. Putties have been suggested as a substitute. When properly put on they give great support to the muscles of the leg, and probably for field service nothing better could be adopted. As, however, for recruiting purposes appearance has to be considered, I think some modification of the Highland gaiter or "spat" would meet the conditions of effective leg support combined with smartness.

That the want of cleanliness is a fruitful source of footsoreness is undoubtedly true, unpalatable though the admission may be. In this connexion the question naturally arise:—(1.) Do sufficient facilities exist for the maintenance of considerable bodies of men in a condition of hygienic cleanliness? (2) Is sufficient supervision exercised to ensure the existing facilities being made use of to the fullest practicable extent? To both questions, in my opinion, a decidedly negative reply must be be given. I believe that the simple process of washing his face is in some places so hedged round with obstacles, at any rate after a certain hour in the day, that the only wonder is that the private soldier manages to show himself so outwardly clean as he does. With regard to supervision in this matter, provided a man turns out on parade with his hands and face clean, nothing more is expected of him. I have frequently inspected men who, judging from externals, would be taken to be thoroughly clean in their persons, turn out on closer acquaintance veritable whited sepulchres of the unwashed, grimy, evil-smelling residuum of humanity.

Is it to be expected that men in such condition, with the concomitant evil of socks worn till rotten with dirt and perspiration and possibly, nay probably, in holes, could march? Surely not. Fortunately, the remedy for this is an easy one. The first essential is sufficient ablutionary accommodation with warm water provided; the second that the careless soldier makes use of the facilities provided for keeping himself clean. That this latter proposition is difficult of accomplishment, I am ready to admit, but difficult as it may be, it is, I think, well within the range of practical politics. I would suggest as a step towards its accomplishment that the present method of conducting the weekly kit inspection be altogether changed. At present the soldier in most regiments stands buttoned up at his kit, and, provided the kit as laid out is all right, few officers take the trouble to see that the articles shown are the articles worn. A simple way of getting over the difficulty would be to have the man show his dirty shirt and socks in his kit, he himself standing in his shirt sleeves with bare feet, his clean shirt on, and his clean socks ready to put on, after his feet have been inspected.

That the soldier should, whilst on the march, have at least three pairs of serviceable woollen socks is, in my opinion, absolutely essential, if he is to wear socks at all. When halted for the night the necessity for bathing his feet and changing his socks should be inculcated. But with every precaution, cases of blistered feet will occur, and to the young soldier, ignorant of the proper treatment to adopt, be sufficiently painful. Yet, given well-fitting boots and dry clean socks, there is not the slightest reason why a man should be incapacitated from marching through this cause. If that part of the sock where the blister touches be thoroughly soaped it will usually be found that what was previously extremely painful now causes not the slightest inconvenience.

When something has been done in the way of practical instruction to the men in the hygiene of the feet a distinct advance will have been made; and in view of the large number who suffer from such minor ailments as corns, bunions, and ingrowing nails, it would be by no means a loss to the State if a certain number of men in each battalion were to receive some training as chiropodists.

It is an open question whether the application of fatty dressings to the feet before marching is an advantage. During the Franco-Prussian war the Germans are said to have used an ointment composed of one part of tannin to 20 parts of zinc ointment, but with what result, I cannot say. Several preparations of an earthy nature have been extensively advertised of recent years, but it is, I think, quite useless to consider anything of this sort which is not at all times readily obtainable. This condition is met by common yellow soap, than which to a tired hot foot there is nothing more grateful. Brigade-Surgeon-Lieut.-Colonel R. Exham, A.M.S., strongly recommends soaping the *outside* of the sock.

Exhaustion.

This is not only a much more serious disability than footsoreness, but one for which, as regards its causation and prevention, we must take a very considerably wider field of inquiry. In the introductory portion of this paper, I endeavoured to show that man for man, and age for age, the individual of the class from which the British recruit is taken is at least as good as his continental *confrère*. Personally, I believe him to be very much better. Assuming him to be as good, to what cause are we to attribute his defective marching powers?

To this question a ready answer is forthcoming. While, on the Continent, the registration laws effectually preclude the clandestine admission of immature lads into the army, and the conscription regulations wisely fix the age of liability to serve at from 20 to 22 years; in our service the exigencies of a voluntarily recruited army compel the acceptance of youths, who, although fulfilling the requirements of the fixed standard, in point of height and chest measurement, are in many, nay most cases, mere boys. Granted that these boys will become men, and very fine men, the fact must be conceded that until they have attained manhood the system is wrong which requires them to perform the duties of men. If, on the other hand, however, the Home

Army is to be considered only as a training school for the Foreign one, that the youths composing it are not to be considered soldiers, but as merely under training to become soldiers, then some modification in the present system of educating them up to the required point must be considered.

Food and drink.

Although very considerable improvements in the quality and method of cooking the food of the soldier have taken place within recent years, it is, in my opinion, extremely doubtful if the food ration is sufficient in quantity. It must be borne in mind that to a growing youth, under any circumstances, three-quarters of a pound of meat including bone, and a pound of bread, does not appear an unduly liberal amount of food for a day. Compare it with that eaten by the average healthy middle-class schoolboy, and then consider the constant hard exercise in the open air of the army recruit. Of course, for an old seasoned soldier it is quite sufficient, and it is just here that a curious circumstance bearing on the food question might be brought to notice. When the number of recruits in a regiment was small in comparison to the number of old soldiers, the former always had a sufficiency of food gained by the want of appetite of their older comrades. Of course there was often a *quid pro quo*, in the shape of beer, but still the youngsters had enough to eat. Now they are all, Tom, Dick, and Harry, ravenous as young wolves.

That a sufficiency of good food has a very marked effect on the marching powers of the young soldier, was brought very prominently to my notice during the march of the 1st Battalion of the Welsh Regiment from Pembroke Dock to Cardiff. The weather was extremely wet and depressing and the men mostly very young, there being few over two years' service. Notwithstanding these drawbacks, they marched well and cheerfully, and there was little or no sickness, and this I attribute in a great measure, to the fact that they had, through the hospitality of the country people, abundance of food. On the march, the men had a pint of beer and as much bread and cheese as they could eat, and on reaching the camp they had a second pint of beer with their dinners. Of course, there is much to be said both for and against alcohol for men undergoing great physical exertion, but my opinion is, that under certain circumstances, and provided food be taken with the beer, a limited quantity of alcohol in this form has a decidedly beneficial effect as a preventive of exhaustion. It is well, however, I think, to refrain from issuing it until about two-thirds of the distance has been covered.

With regard to the feeding of the young soldier generally, and in this category I should include all under 20 years of age, and in the case of men who are 20 years old or over on enlistment, those under one year's service, I am fully convinced that a considerable increase in the ration is necessary. Notwithstanding the steps which have been taken in the way of getting the utmost nutriment out of the present ration, a close inquiry discloses the fact that young lads coming in with appetites whetted from early morning parade, frequently consume the whole of their bread supply for breakfast, and for a similar reason nothing is left of the meat after the mid-day meal. To meet the waste of tissue consequent on hard physical exercise, I consider that the bread ration should be increased to one and a half pounds per diem, that the 12 ounces of meat should be free from bone, and that a small daily ration of cheese should be provided free. If this were conceded, I should advocate that the cheese ration and part of the bread be eaten as lunch about noon, and the dinner hour altered from 1 o'clock to 2 or 2.30 p.m. As a matter of fact during route-marches or field-days, dinner is seldom served before that hour.

Weight to be carried.

Paragraph 14, section XVI., Queen's Regulations, lays down the rule that "shorter marches will be made in marching order, but commanding officers "may use their discretion in excusing young soldiers from carrying their "valises." This is no doubt an excellent rule, and at first sight appears to dispose of the serious objection which might arise from a young soldier being taxed beyond his strength. It is well, however, not to rush to too hasty a conclusion as to its perfect efficacy. Strangely enough, one of the finest traits of the British soldier goes far to render it a dead letter—*esprit de corps*. The bull-dog tenacity, the pluck displayed by the youngsters of our Line Battalions, their determination not to give in while they can put one foot before the other, is simply astonishing—and this characteristic—the credit of his regiment, and the wish to stand well in the eyes of his officers, and especially of his comrades, is a strong inducement for a lad to evade any indulgence which would tend to depreciate him or the corps to which he belongs, in the eyes of others.

The average weight carried by the British infantryman is about 60 lbs., that of the French and German is from 65 to 70 lbs. In the German service especially, great endeavours are being made to lighten the soldier's burden; experiments have been going on for some time in the use of aluminum whereever practicable, and in the elimination from the kit of all articles not absolutely necessary. The present British infantry equipment, while a great advance on the old square knapsack, still leaves much to be desired. Its defects are clearly pointed out in the Report on Mobilization, 1st Brigade, 1st Division, 1st Army Corps, 1896.

This Report is as follows:—

"(1.) When packed it (the valise) is convex at the back, and is therefore constantly wobbling.

"(2.) Without ball ammunition, it is badly balanced.

"(3.) Practically the whole strain comes on the braces, which cut into the shoulders and check lung expansion.

"(4.) The whole weight (which should be carried on the shoulders) is distributed, and the heaviest portion, *i.e*,, the great coat, is carried on the waist and drags on the loins.

"(5.) Equipment cannot be taken off or put on quickly without assistance. With the French equipment, all the weight is carried in the valise, which is high upon the shoulders, and can be taken off and put on by the man in a moment."

On a short man all the drawbacks are emphasised, and yet it is difficult to suggest a remedy. The lower the valise equipment hangs, the more it drags, and yet if raised much above the man's shoulders it prevents the circulation of the free current of air about the neck which it is so essential to maintain. Again, any thickening of the valise by putting the great coat either inside or outside the flap is to be deprecated, having in view the increased strain on the shoulders caused by leverage.

The old pattern Italian-water bottle is gradually being replaced by one of enamelled iron covered with felt. It holds more water than the Italian pattern does, and keeps it cooler. It has also the decided advantage of hanging over the shoulder instead of being fastened to the already overburdened waistbelt. While it is becoming more than ever recognised that for rapidity of movement the soldier must be as lightly weighted as possible, it is difficult to see in what direction any reduction can be effected in the weight of the present service kit, except what little can be done by the substitution wherever possible of a lighter metal for that at present in use for accoutrements, mess tin, &c., and the total abolition of such as is purely ornamental. An officer in the Italian Army has recently invented a light cart intended to carry the impedimenta of two men, and to be pushed by each in turn. As instancing the fact that the weight-carrying question is receiving attention at other hands than our own the intelligence is interesting. As for the rest—well, the spectacle of an army with every second man pushing a hand-cart, would be worth seeing.

The clothing of the infantry soldier as affecting his marching power, is in my opinion not nearly so bad as it has been painted. Still there are one or two points in connexion with it which call for consideration with a view to improvement, and in this the head-dress unquestionably takes the first place. Clothing.

The helmet, though probably an advance on the various descriptions of shakos which preceded it, still leaves a great deal to be wished for. It is heavy, weighing 14½ ozs.; being pointed in front it leaves the temples exposed to the sun's rays; while the back part is not low enough to afford any protection to the neck it is too low to admit of the soldier using his rifle when lying down. It is seldom properly fitted, the tendency being to have it too small, and under such circumstances it is apt to cause neuralgia of the scalp.

The second and third objections might possibly be mitigated to a certain extent by an alteration of the shape; but the objections are so many that the only effective improvement would be to improve it away altogether.

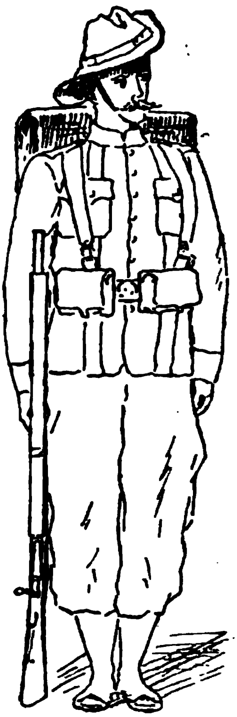
The chief objections to the Fusilier busby are its weight, 24 ozs., and the large surface which it exposes to the wind.

The Highland bonnet, though partaking of the latter objection, possesses in a marked degree several of the desiderata of an ideal head-dress. It is light, perfectly ventilated, and, from the constant motion of the foxtails, a fan-like action is given to the air, preculiarly grateful. That it is picturesque is no drawback, and, indeed, there seems no good reason why picturesqueness and utility should not go hand-in-hand.

That the solution of the Infantry head-dress question is to be found in some modification of the large, soft felt hat worn by Colonial troops, I am fully convinced. It is a curious circumstance that in no army in Europe is the head-dress problem satisfactorily solved. Possibly the nearest perfection is reached in the Italian bersaglieri if the material were grey instead of dark green.

With regard to the frock worn in marching order, the tendency is to have it too close-fitting, although the authorities of the clothing department do all in their power to prevent this. Of course, this tendency is due to a mistaken idea of smartness; but perhaps it could be best combatted by altering the shape to that of a Norfolk jacket, without the band, with four outside pockets. It is strange that such an obvious necessity as pockets in a garment intended for field service should have been until lately lost sight of.

The trousers, as at present made, are much too tight for service purposes. While they might be retained for dress occasions, I would strongly advocate some modification of the knickerbockers as a garment for marching and fighting. These with the puttie or modified Highland spat, Norfolk jacket, and felt hat, would go far to solve the question of a suitable dress for campaigning purposes. I append a sketch which I hope will make my meaning clear.



Debilitating influences.

Among the causes which may be cited as exercising a debilitating effect on the soldier, and particularly the young soldier, are over-indulgence in drink, unrestricted sexual intercourse, and excessive use of tobacco. As regards the first, every year shows an improvement, and probably in the course of time the spread of education will have the effect of reducing this cause of inefficiency to a *quantité négligible.* The second is now receiving attention at the hands of the authorities, and for that reason I do not purpose entering upon it here. With regard to the tobacco habit, I am far from asserting that a moderate indulgence is a thing to be deprecated. On the contrary, I believe that an occasional pipe goes far to relieve the tedium of a long march. Of recent years, however, the practice of cigarette smoking has developed to an incredible degree amongst young soldiers; this habit undoubtedly tends to disturb the digestive and circulatory functions, and should be discouraged.

Effect of marching.

The effect of marching when well regulated is, as might be expected, unquestionably beneficial to the soldier. He gains in weight, the muscles become firmer and well-developed, his face becomes ruddy and free from all signs of anæmia. When marching is injurious, the effect is found to be precisely the reverse; there is loss of weight, muscular flabbiness, and a thin worried look with anæmia. During the route-marching season of 1896–97, 35 men of the 2nd Battalion King's Own Royal Lancaster Regiment were weighed before and after the six days' continuous marching, with the following result:—

28 men lost weight, some as much as 3 lbs., one man losing 5 lbs.

1 man who did not complete the march gained 2 lbs.

6 men did not vary.

With regard to the effect on the urine, the "British Medical Journal" gives the result of an exhaustive examination of 142 soldiers in Ireland by Surgeon-Captain J. R. Forrest, who made 294 observations. The men were all healthy and free from gonorrhœa; they were marching 10 to 20 miles a day, carrying full service kit, and their urine was tested before and after the march. He found that out of the 142 men, 14 presented albumen in their urine. In 9 of these 14 cases, albumen was not found, on testing for it both before and after a subsequent day's march. The invariable effect of the march was either to abolish the albumen found before the march or to lessen the amount.

Over-exertion, long-continued, is almost certain to give rise to the condition known as irritable heart, especially in young soldiers of intemperate habits or addicted to over-indulgence in tobacco.

Conclusion.

While the present system of enlistment exists and recruits have of necessity to be accepted while in a state of immaturity, the training in marching must be very gradual, and should, so far as is possible, be carried out during the whole year, instead of being compressed into a limited part of the autumn or winter. The company training, which includes lectures indoors, might be confined to the winter months in parts of the country where the humidity renders route marching impracticable. Much benefit would accrue if the periodical changes of stations were carried out by route-march. It is a *sine quâ non* that every man be exercised. Under the present regulations of confining the practice to the period between the 15th October and 15th March, a large number of men are on furlough, and so escape the training altogether.

The Regulations explicitly state that the marches are to be progressive, beginning with nine miles and gradually increasing to 16 miles. This regulation should be most rigidly adhered to, and the practice found to exist in some regiments of endeavouring to make records firmly prohibited. I am further of opinion that for lads under one year's service, a maximum of 10 miles in marching order should not be exceeded.

The habit of singing on the march should be encouraged to the fullest extent, and the practice of singing might in fine evenings be taught by the bandmaster on the barrack square, with the effect of dissipating the ennui, which finds its result to a very considerable extent in the forming of undesirable acquaintances with its concomitant evils. The German and Russian troops habitually sing on the march, and to hear one of our battalions (as one sometimes does, though seldom) trolling forth such an air as "Marching to Georgia" or the "Old Brigade" to the accompaniment of the band, one can only ask regretfully why the practice of singing is not more encouraged than it is? While any tendency to lengthen the column by opening the sections from front to rear is objectionable, as calculated to drag the men in rear, the individual members of sections of fours should, when marching at ease, be enjoined to open out freely from each other in order to have a sufficiency of breathing space.

Finally, I would strongly recommend as an absolute necessity the establishment of sufficient lavatory accommodation, the frequent and careful inspection of the men's feet and their foot-covering, and an increase in the rations.

Although want of stamina and physique were regarded as the chief causes of the shortcomings in the march to the New Forest in 1895, it is now known that in a great measure the failure was due to insufficient training. The wonderful effect of gymnastics in improving the physique, and the no less wonderful effect of careful training in drill and musketry in fashioning the country yokel into the smart well set-up soldier, show what can be done by constantly-graduated practice; therefore, in training our young soldiers in their important rôle of covering the greatest ground in the shortest time, our motto should be *Festina lente.*

APPENDIX No. XII.

ON THE MALARIAL FEVERS OF THE WEST COAST OF AFRICA.

By Surgeon-Major R. CROFTS, Army Medical Staff.

Malarial diseases occur all along the West Coast of Africa, in dry as well as marshy situations, in elevated regions as well as low-lying ones. There is no interval; they are present all the year round, but are more numerous and severe in type during the rainy season. That they are not solely due to high temperature, decaying vegetation, the amount of water in the soil, or to disintegrating rock, is proved by their absence in various parts of the world where those conditions are present; but no doubt such conditions facilitate the development and propagation of the malarial poison where such poison exists.

We know that some malarial regions have become healthy by drainage, and again malarial affections are always more rife during the rainy season, thus showing the influence of the amount of water in the soil.

One of the most important lessons to be learned on the West Coast of Africa is to avoid high temperatures, especially the direct rays of the sun, which have a peculiarly pernicious effect. I have never known the case of a white man who has exposed himself to the sun who did not get remittent fever, generally of a severe type.

How does the sun act? (*a*) It has an enervating and exhausting effect upon the individual, thus diminishing his power of resisting disease. (*b*) It probably increases the activity of the malarial poison with which his body is saturated. (*c*) The emanations of the malarial poison are more intense during the evaporation that goes on from the soil when it is greatly heated.

The West India soldiers, who can stand the sun-heat (often more intense) in the West Indies with impunity, quickly get knocked up if exposed to it in West Africa, although not to such a marked extent as Europeans.

I never saw any bad effect from night air in West Africa, and I would rather stay out every night for a week than stand one hour in the sun. It would lead greatly to the improvement of the health of all ranks on the West Coast of Africa if all parades in the open were forbidden between the hours of 9 a.m. and 4.30 p.m. As to decaying vegetation, there is no doubt that its careful removal and destruction tends to the improvement of the general health. The effect of disintegrating rocks is well shown in the history of Hong Kong and Cape Coast Castle.

Another point of great importance is to disturb the ground as little as possible in the neighbourhood of dwellings. I know the case of a medical officer who used to get an attack of remittent fever every time the gravel was scraped in front of the officers' quarters in Sierra Leone, and he had eventually to be invalided.

Ague.—Strange to say, ague is not very prevalent on the West Coast of Africa, bearing but a small proportion to the number of cases of remittent fever. The cases are generally of an ill-defined character, thus there is scarcely ever a cold stage or shivering. The quotidian and tertian varieties are the most prevalent; I have never seen a case of quartan ague on the coast. Chronic enlargement of the spleen is almost unknown. The ordinary cases of ague quickly yield to dieting, diaphoretics, quinine, and arsenic, the administration of which will be described in detail under remittent fever.

Remittent Fever.—This is beyond all others the most important disease in West Africa, and the one with which the Army Medical Officer is brought most frequently in contact. It renders a large proportion of the troops serving there inefficient, and leads to a large amount of invaliding and consequent expense to the country. Hence any observations that would lead to the diminution of the number of deaths or of invalids—the number or severity of the cases—are of great importance.

Predisposing Causes. Age.—Youths and elderly people are far more susceptible to the influence of malaria than others. If attention was given to this point in the selection of officers and non-commissioned officers for service in the West African Command there would be less remittent fever. No European officer or non-commissioned officer ought to be sent to West Africa until he is at least twenty-six years old. Sir William Aitkin has clearly demonstrated that the process of growth is not completed until that age is reached, and experience has taught that officers under that age do especially badly in West Africa. Yet young officers are constantly sent to join the West India Regiment in Sierra Leone, or come there with their regiment under that age. I have known young officers of 20 years on the coast. They almost invariably quickly run down in health, and in a short time have to be invalided. If it is necessary to admit young officers of this age into the West India Regiment, it would be better to attach them to the battalion in Jamaica until they at least reach the age of 26 years. Men will but rarely stand the coast after 50 years of age.

Sex.—As a rule, among Europeans women are more susceptible to West Africa remittent fever than men.

Idiosyncrasy has great influence in determining the liability of persons to remittent fever. Of a number of persons living under similar conditions, some are continually getting attacked, while others practically escape. People with fair complexion and light-coloured hair stand the climate best; the red-haired get less remittent fever than any others. I have known several of the latter on the coast and have never been called upon to treat them for remittent fever. The youth who is brought up in the East Indies does very badly on the West Coast of Africa. I have known two young officers who were thus reared; they were both invalided after a short stay on the coast, and both have left the service. Officers who exchange into the West India Regiment, and who have served in East Indies with their former regiment, do badly on the coast.

Occupation has much to do with the liability of individuals to attacks of remittent fever. There is no doubt that regular daily employment is beneficial to health in West Africa as elsewhere, but no European can continue for any length of time in works that expose him to the sun, at least, between the hours of 9 a.m. and 4.30 p.m.; if thus exposed he quickly runs down in health, shows marked signs of malarial cachexia, and is almost certain to get attacked by remittent fever.

As to habits of life, in the exhausting climate of West Africa it is necessary to take a greater amount of rest than in better climates.

Food.—This is good with the exception of meat, which at the best of times is of but poor quality; but it is much improved, at least in Sierra Leone, during the last few years, as there is a better trade with the interior since the marauding Jounis and Sofa Chiefs have been put down. But it is in the proper use of meat that the officer in West Africa seems to have but little knowledge. As a rule he eats three large meat meals daily. One man eats enough nitrogenous food for three; and in addition he has two other meals of tea with hot toast and butter—one in the early morning and the second in the afternoon. As a consequence in a short time he gets dyspeptic from the enormous amount of unnecessary work thrown upon his digestive organs, gets run down in health, and thus renders himself more liable to remittent fever. As to the use of alcohol in West Africa and its effect on the health much might be written. During a long residence on the coast I have known all sorts of men—total abstainers, moderate drinkers, occasional drunkards, and habitual drunkards. I have no prejudice whatever either for or against alcohol. The European total abstainer on the West Coast of Africa almost invariably dies; it does not matter what his position is, what his work is, how much care he takes of himself, nor what attention he pays to his diet; you can see him gradually running down in health, and if he does not get invalided he is sure to die. Of course occasional or habitual excess in alcohol is to be deplored, and it is but too common on the coast, and is the cause of many a death and invaliding that is fathered on the climate.

No alcoholic drinks should be taken before sundown. The morning drinker is a most pernicious man and the midday drinker is but little better; they do harm to their own health and injure others by their example. But there is no doubt that when the day's work is done, when the individual feels that evening exhaustion which seems inseparable from the West Coast of Africa, a little alcohol either with or after his dinner is not only pleasant and desirable, but absolutely necessary. Some men are so strong that they can live one and even two tours on the coast without alcohol, but they are sure to succumb in the end.

Any privation which runs down the health renders one more liable to an attack of remittent fever; and this affords no exemption to another attack, but rather renders the individual more liable to its repetition.

Night air is a regular bugbear on the West Coast of Africa. People come there with the most extraordinary idea of its injurious effect. They close up the windows and doors in their quarters, breathe an impure atmosphere for half their lives, and still expect to be in good health. Admitting that a clear distinction should be made between draught and ventilation; and that the former should be avoided, still it is absolutely necessary for the preservation of health in West Africa that one's quarters should have good ventilation, not only by day but also at night. It is very easy to have too little air, but one can scarcely have too much. During five tours of duty in West Africa, I have slept with at least some of my windows open, and attribute the excellent health I have had there in no small degree to this fact. Avoid draught and night air will do no harm.

A man may get an attack of remittent fever in 24 hours after his arrival on the West Coast, but the period in which he got his first attack is generally from six weeks to three months. There is but rarely any shivering before an attack of remittent fever. The first symptom is almost invariably a pain across the loins. This is as constant in remittent fever as in small-pox, but it is generally not so severe in the former. Soon there is a feeling of soreness in the lower extremities and hands, then frontal headache, accompanied with nausea, quickly leading to vomiting. The pulse is about 100 per minute; temperature from 100° F. to 104° F. or even higher; tongue, clean; skin, dry; face, anxious.

Now what is to be done? The first thing is to attack the vomiting. On the proper treatment of this depends in many cases the duration and severity of the fever, and the success of the treatment. I have seen patients constantly vomiting or trying to vomit for hours. I have been in a very weak condition myself from constant and repeated attempts to vomit, but I found that all this was unnecessary and easily stopped. The effort to vomit depends not only upon the nervous effects produced by the malarial poison, but is due more to the irritating local effects of undigested food, gastric juice, saliva, &c., in the stomach.

Drugs such as bismuth and opium administered with the idea of diminishing the irritability of the stomach are worse than useless, they do no good but are rather aggravating. The vomiting is an effort of nature to get rid of the irritable contents of the stomach, and the duty of the physician is to assist nature and not to impede its action. A dirty stomach ought to be cleaned in the some way as a dirty face—by washing it with water. Let a patient in the above condition drink half a pint of lukewarm or cold water; he has scarcely swallowed it when up it comes with the glairy, sticky contents of the stomach which he has been vainly trying to vomit. This process should be repeated three or four times until the water comes back almost as pure as when swallowed. With the last half pint of water swallowed the patient may have to irritate his throat with his finger to produce vomiting. The patient in a few minutes finds the intense sickly frontal headache nearly disappear, with a cessation of the nausea and attempts to vomit. His temperature rarely runs so high as it would do if this treatment is omitted; it is easier to produce diaphoresis, the stomach retains the diaphoretic, and in a short time the patient can take and retain appropriate nourishment. It is rarely necessary to repeat this treatment, except in very severe cases, or where it has been omitted at the outset, but when necessary to repeat it, it always produces great relief. Of course this nausea and vomiting is not present in all cases of remittent fever, but it generally is.

Before giving a diaphoretic ascertain if the bowels are acting freely. It is not enough to ask the patient if his bowels have been regular. Some men think the bowels are regular if they act every second or third day, while others look upon themselves as constipated with bowels acting two or three times daily. In every case in which it is permissible (and in every case except where there is diarrhœa or dysentery it is permissible) give a purgative with the diaphoretic.

And now as to the best diaphoretic and purgative. The two most valuable diaphoretics in these cases are beyond question antipyrin and antifebrin. From a large experience in the use of these drugs I have come to the conclusion that the latter is unquestionably the more valuable of the two, and it has also the advantage of cheapness. With antifebrin diaphoresis is produced more quickly, and the diaphoretic effect is much more prolonged than with antipyrin. I never saw any ill-effects produced upon the heart by the administration of antifebrin. The dose should be gr. v to commence with. The purgative to be given should be calomel, dose gr. v to gr. x. There is no other purgative medicine that can compare with it in remittent fever. It seems to have almost a specific action, and should be given in every uncomplicated case. Mix the calomel and antifebrin together; place them on the back of the tongue, and let the patient swallow them with a little water, when he will retain them if he has been treated as above for the nausea or vomiting, otherwise he will very likely reject them.

At the first visit the patient's urine should be examined for albumen and bile, also the lungs should be examined to make sure that the case is not one of pneumonia. Where one is accustomed to see many cases of remittent fever daily he is apt, if not very careful, to mistake a case of commencing pneumonia for remittent fever. This is avoided by the careful examination of the lungs.

Before proceeding with the further treatment of the remittent fever of West Africa, I would enter the strongest protest against the use of opium or any of its preparations. This is a point that is well understood by old coast physicians. Opium has the most deadly and pernicious effect; it will convert a simple case into a complicated one, and make a severe case still worse.

The functions of the kidneys are always more or less interfered with in this fever. There is invariably some congestion of those organs, and only too frequently inflammation, and opium has a lamentable effect upon their condition. If called in to see a case in which opium has been administered I always take a very grave view of it. Young physicians, who are not aware of the action of opium in these cases, are frequently led to give it to allay irritability of the stomach; or often, at the urgent request of the patient, as a sleeping draught. There is only one class of case in which opium is admissible, and that is where the fever is accompanied with profuse diarrhœa or dysentery, and where other means have failed to stay these disorders.

The two great curative drugs in remittent fever are, of course, quinine and arsenic. The opinions in West Africa as to the value of quinine in remittent fever are many and conflicting. Having used it for over eleven years in the treatment of this disease, I have come to the conclusion that it is an undoubtedly valuable drug—I have tried it in small, moderate, and large doses—administered in various ways, at all times during the course of the fever, and at various times of the day. That it is not a specific, that unaided it will not cure every case, there is no doubt; indeed, in some epidemics, if trusted to alone, the absence of any apparent good effects is calculated to make one almost lose faith in it. The amount of quinine to be given is of very great importance. Having used it in many thousands of cases and in various amounts, I have come to the conclusion that all the good that is in quinine can be obtained from 15 grains daily. There is no advantage in the administration of large doses. A temperature not affected by 15 grains daily will not be effected by even 150 grains, or any intermediate amount. On the other hand the patient's condition is aggravated by huge doses of quinine.

All the symptoms of cinchonism are produced, and the patient's debilitated condition rendered still more profound; what little digestive capabilities he has left are diminished, and he becomes anxious, watchful, and sleepless.

The best way to give quinine is to make the sulphate into pills with a thick mucilage of gum; the pills are then allowed to dry. These are easily taken, do not irritate the stomach, and dissolve quickly. The mixture made by dissolving quinine in water with dilute sulphuric acid is a bad one; it is very likely to cause nausea and vomiting. The form of quinine soluble in water is but little better. If the stomach is too irritable to retain quinine, it may be given per rectum, or in very urgent cases by hypodermic injection. The best time to give quinine is before 12 noon, when the temperature is generally lowest. Gr. vii. ss. at 6 a.m., and gr. vii. ss. at 10 a.m. is perhaps the best way to give it.

Arsenic is a drug of incalculable value in the treatment of the coast fever, and should be given in every case where there is not diarrhœa or dysentery. It is far superior to quinine as a curative agent, and if I were allowed only one of those drugs in the treatment of my cases I should certainly prefer arsenic. The patient should be put under the influence of arsenic as quickly as possible, giving it every four hours, and in urgent cases every two hours. The best form is Liq. arsenicalis. As to the dose, it must be remembered that arsenic is an accumulative drug, so to get a constant effect the dose at first should be a large one, and then gradually diminished. If a patient takes a given quantity of Liq. arsenicalis, say, m. 32, in 24 hours, only a portion of this acts at once on his system, the remainder being accumulated in his body, and this accumulated portion is gradually given up and produces the physiological and medicinal effects of the drug; hence the dose should be gradually diminished. In ordinary cases Liq. arsenicalis, m. 10, every four hours will be sufficient to commence with. It can be given in water, or, as it is nearly tasteless, in the patient's milk or beef tea. The almost invariable first sign of the patient having had a sufficient quantity of arsenic is looseness of the bowels, and on this appearing the arsenic ought to be stopped for a few doses. Of course, the physician must look out for the other symptoms of arsenic poisoning.

In ordinary cases of remittent fever the antifebrin may have to be repeated every evening for two or three evenings as there is an almost constant evening rise of temperature. The diet should consist entirely of milk and beef tea, or chicken broth, in small quantities every couple of hours. Treated as above, all ordinary cases of West African remittent fever will recover quickly.

The most important complications of remittent fever are high temperature and hyperpyrexia, albuminuria, hæmaturia, jaundice, cardiac clot, serous effusion into cavities of brain, and parotitis.

High Temperature and Hyperpyrexia.—It may be laid down as a rule in cases of West African remittent fever, that they assume a very serious aspect when the temperature rises to 105° F. or higher. For instance, a case with a temperature of 105·5° F. is of much more grave import than a case with a temperature of 104·5° F., more so than the difference of 1° F. would seem to warrant. It but too frequently happens that notwithstanding the most careful treatment of the patient from the onset of the attack, due attention having been paid to the vomiting, the condition of the bowels, and dieting, the repeated production of profuse diaphoresis, and the careful and continued administration of both quinine and arsenic, still not only does the temperature not become lower, but it rises steadily and is marked with but little remission. The patient shows great disinclination to take food, his pulse becomes quick, feeble, and compressible, respirations hurried and shallow, tongue dry and brown, and face very anxious. It should be noted that this condition may arise in a very short time after the onset of the fever, even during the second day, but, as a rule, later. This will not be wondered at if it is remembered that in many cases we are dealing with patients whose strength and constitution have been run down by residing on the coast.

Now profuse diaphoresis has been tried repeatedly, and has had practically no effect; and it should be noted that in these cases the skin, having acted well several times, frequently refuses to again respond to diaphoretics. They may be given even in large and repeated doses, but the skin remains as hot and dry as before, and the only effect seems to be to make the patient's prostration still more profound. Now there is but one treatment suitable for such cases, a treatment which, if carried out conscientiously, will be found to be almost invariably successful. This is cold water sponging and cold water packing. I have only seen one fatal case where this was tried with my patients (this case I shall refer to under cerebral effusion), and I have seen very many successful ones. It is the greatest fallacy to suppose that the patient is too weak to stand such treatment. No matter how weak he is he can stand it better than a continued high temperature; and if not tried the only alternative in the great majority of cases is death.

Just a case to show the benefit of this treatment. In proceeding with a detachment, consisting of two officers and 100 men of the West India Regiment, on board the s.s. "Lagos," from Sierra Leone to Lagos in 1892, to take part in the Jebu expedition, both officers were attacked with remittent fever. One of the cases was very severe and protracted. It was treated carefully, but the temperature went on daily from 102° F. to 104° F. After diaphoresis it would fall to about 102° F., but quickly rise again. The patient (naturally of a fragile constitution) got gradually weaker, and arrived at a stage when antipyrin (I was then using this drug) had no effect. He had four gr. x doses of this medicine in 24 hours without the production of sweating. About eight days after the commencement of the fever his temperature rapidly rose to 107·6° F.; he was lying entirely unconscious, with muttering delirium, and that peculiarly grave "gallop" in the pulse, where one beat seems to run into another; respirations quick and shallow. He was to all appearance dying. I at once began sponging him with cold water, using it plentifully. The effect was striking; the patient gradually began to regain consciousness, and to protest against his treatment; pulse slower, more regular and stronger; respirations slower and deeper. In one hour his temperature had fallen to 101·6° F.; he was then packed in sheets wrung out of cold water. His temperature remained steadily at 101·6° F. for 24 hours, and then it fell gradually to normal. He made complete recovery. This is but one of many similar cases I have seen. The treatment should not be delayed when other means fail.

Albuminuria.—In all cases of West African remittent fever, the urine should be examined. It is astonishing how often it will be found to contain albumen. It is, of course, of the greatest importance to recognise this at once. The albumen will generally disappear on the cessation of the fever, but sometimes results in chronic Bright's disease; this latter, however, is infrequent. The albumen is probably due, in the majority of cases, to the pressure in the renal capillaries, or to the exuding of the serum through the capillary walls. Locally hot fomentations or poultices of digitalis leaves or linseed meal will be found to be useful; the bowels should be kept well open. It must be remembered that the condition is due to malaria, and the most appropriate medicines are, therefore, quinine and arsenic; a little digitalis may be desirable, but no preparation of opium should be given, or the affection will be seriously aggravated. During convalescence iron in conjunction with quinine will be of value.

Hæmaturia and Hæmoglobinuria.—This is by no means uncommon as a complication of remittent fever, constituting the dreaded "blackwater fever" of the coast. It may not be seen at a station for months or even years, when numbers of cases may occur within a short time. The onset is frequently very sudden and the fever accompanying it intractable. The urine varies in colour from a smoky brown to the hue of porter. Albumen is readily yielded. Under the microscope blood-cells can sometimes be detected either entire or in a more or less disintegrated condition, but sometimes it appears that it is only the colouring matter of the blood that is in the urine. Calomel is not contra-indicated in these cases, but seems to have a very beneficial effect. Tube casts are nearly always present; the blood comes from the substance of the kidneys, which in all these cases are intensely congested and frequently inflammation is also present. The local applications should be the same as mentioned above for albuminuria. Quinine and arsenic should be persisted in. I have never seen a death from "blackwater fever."

Jaundice is a grave complication. It belongs to that class in which there is no obstruction to the bile duct, and is probably of hæmatogenous origin.

The malarial poison always causes more or less disintegration of the red-blood cells, and this by interfering with the metamorphosis of the tissues causes the jaundice. Such cases should be treated as cases of remittent fever. Diluted hydrochloric acid kept applied on lint over the region of liver is of value.

Cardiac Clot.—This of all others is the most frequent cause of death in West African remittent fevers, and it is a cause of death which is not at all sufficiently recognised. It is quite a common thing for cases to terminate fatally when the temperature is only 100° to 102° F. These deaths are often attributed to exhaustion, but if a post-mortem examination is made ante-mortem cardiac clots will, in the great majority of cases, be found not only in the ventricles, but intertwined among the valves. There is no mistaking the hard, pale ante-mortem clot for a post-mortem one. If the formation of these clots could be prevented, the chief danger of West African remittent fever would be removed, and the success of a physician in treating his cases depends to a large extent on his taking precautions to this end. The formation of the clot is favoured by two causes, the increase of the elements of fibrin in the blood, and the weak cardiac action. Then the indication is clear, diminish the elements of fibrin in the blood, and sustain the cardiac action. The first object is attained by the administration of carbonate of ammonia; it should be given in all cases where the heart shows signs of failure. This is the most important item in the treatment of remittent fever. The heart's actions should be sustained by stimulants and proper diet, given at frequent intervals. Of medicinal stimulants the best are spt. ammon. aromat. and camphor. As to the administration of alcohol it must be remembered that generally we are dealing with patients whose strength has been run down by residence on the coast; hence they require alcohol early. Some may require it the first day, some the second or third; but all cases of any severity do require it. It is useless to try to treat the cases without it. All fevers must be fed; and this is particularly true of the coast remittent fever. It is strange how very little indication there is of the clots before death; hardly ever a murmur, usually only a muffling of the heart sounds.

Cerebral Effusion.—Just as the serum of the blood exudes from the capillaries of the kidneys in some cases of this fever, it exudes from the cerebral capillaries in others. Fortunately this is rare. The patient gets into a condition resembling apoplexy, becomes totally unconscious and dies. Once it has occurred there seems to be no cure, but proper nourishment of the walls of the capillaries by food and stimulation is no doubt a preventive.

Parotitis.—This is a particularly serious complication; I have only treated two cases, one of which ended fatally, and have seen two other cases, both fatal. One or both parotids inflame and quickly break down into abscesses. Sometimes the submaxillary glands and connective tissue take on a like action. These symptoms are accompanied by great exhaustion. Abscesses should be opened at once, and the patient's strength maintained as far as possible. Murchison mentions some similar cases that happened in his practice in typhus fever.

I have lost four cases of remittent fever. Two of these cases were at Cape Coast Castle during my first tour on the coast. Both the men at the time they were attacked by remittent fever were in hospital for other diseases, one for secondary syphilis and the other for scrofulous glands. They died with temperatures very little above normal, and from the formation of ante-mortem clots in the heart. I had not then recognised the great value of carbonate of ammonia and of early stimulation in these cases. The third case was during the voyage from Sierra Leone to Lagos in 1892, above referred to. After a few days' fever the patient became unconscious, with a temperature of 104° F. Although his temperature was reduced to nearly normal again and again by the application of cold, he remained unconscious for two days and then died. For obvious reasons there was no post-mortem examination. This case was probably one of cerebral effusion. The fourth case was one in which the fever was complicated with acute inflammation of the kidneys, followed by inflammation and abscesses of the parotids and submaxillary glands. At the post-mortem examination the kidneys were found to be reduced to a grumous pulp.

APPENDIX No. XIII.

A CASE OF PHLEGMON OF THE FACE, FOLLOWED BY SLOUGHING OF THE UPPER EYELID AND PARTIAL SUPPRESSION OF URINE, WITH RECOVERY.

By Surgeon-Captain R. A. Bostock, 2nd Battalion Scots Guards.

On 4th June 1897 No. 6520, Private E. B., 1st Grenadier Guards, was admitted to hospital at the Guards' Depôt, Caterham, suffering from swelling of the left upper eyelid. The patient was a healthy-looking recruit, aged 18 years. The eyelid was pale, soft, and œdematous, and the free edge drooped over the lower lid. No blush was noticed. A little watery discharge was noticed coming from under the lid. The eyelid could be easily raised, and the eye was found to be in a healthy condition.

There was no history nor sign of injury, insect sting or foreign body; the patient stated afterwards that he had noticed a "pimple" on the lid, but it was not observed at the time. There was no gonorrhœa or history of possible gonorrnœal contagion.

The eye was bathed with boracic lotion and starch powder was dusted on the lid, a pad of cotton wool being applied. On 5th June there was no alteration in the condition of the parts. On 6th June he was reported to have had a bad night, and the morning temperature was 100·6°. On removing the cotton wool the superficial aspect of the whole eyelid was found to be gangrenous, the edges of the slough being well marked.

The forehead, left side of the scalp, the nose, cheek, lips, and left side of the neck were very much swollen, tense and painful when touched. The lips projected, and the swelling prevented their being closed. The tongue could not be protruded owing to the swollen condition of the cheek and lips; it was not swollen, but could be seen to be heavily furred, and the breath was very offensive. The right eyelid was closed and puffy. No blush was visible, but there was one small bleb on the left cheek. The left eyelid was so tense from the swelling that it was impossible to move it at all, and attempts to do so caused great pain. The patient complained of a heavy feeling in his head. A number of incisions were made in the swollen parts, in the cheek, forehead, temples, and round the eye, but the tissues felt and cut like a raw turnip and there was very little bleeding or oozing. Charcoal poultices were ordered every four hours, which gave considerable relief, and the parts were bathed with hot perchloride lotion when the poultices were changed.

The pulse was fair, the bowels confined.

He was ordered Mist. Sennæ co. ʒ ii.

℞ Tinct. Ferri Perchlor. m. xx.
Tinct. Digitalis m. v.
Aquæ Chlorof. ad. ℥ i.
(Every four hours.)

Milk diet. Two pints milk. Two pints beef tea. Brandy, 10 oz. Eggs, four.

In the evening the general condition was not altered. Pil. Saponis gr. x.

During the day he passed very little urine, not half a pint, very smoky-looking and loaded with more than half albumen.

The incisions were deepened and more were made just clear of the sloughed tissues where the tension seemed greatest.

7th June.—Passed a better night. The swelling of the left side of the head and neck was a trifle less. The left eyelid was in the same condition, the sloughing action not having extended; but the left side of the head was a shapeless mass of swollen tissues, the lips projecting and wide open. Bowels had not acted, so an enema was given and the bowels acted well.

The incisions made on the previous day were now oozing freely, and the extreme tension was less. The urine was still very scanty and dark, and contained ½ albumen. The pulse was now very bad, and the patient was never allowed to be raised up at all, as on one occasion when he was raised up the pulse failed altogether. There was some difficulty in swallowing and a little cough. The same diet and treatment were ordered.

9th June.—The swelling had so far subsided that the left eyelid could be turned up a little, and its under surface inspected. It was congested, but otherwise healthy. The urine contained ⅙ albumen.

10th June.—A strong trace of albumen only. Treatment and diet as before, except that he was given barley water freely and less brandy.

19th June.—The eyelids can now be separated enough for the patient to see light. Is taking roast chop, milk 1 pint, eggs 2, and rice pudding.

The patient now began to improve in every way. The urine became normal. The slough in the eyelid began to separate, and the swelling nearly all subsided. However, the lower eyelid, left side of the nose, and the space between the eye and the ear remained swollen and hard, though no active inflammation could be seen. The slough was cut away as much as possible, and the eyelid dressed with iodoform and boracic lotion.

29th June.—The upper eyelid now consists of the tarsal cartilage covered above with healthy granulation, and drooping far over the lower lid; it can hardly be moved at all. The lower lid and lachrymal region are still swollen, and the swelling in the temporal region is still there. At the outer angle of the eye there is still some slough which seems to extend outwards under the skin towards the ear.

The question now arose as to what the result of the scarring would be, as it seemed only probable that the upper lid would be much everted, and ultimately the eye would be left exposed. The patient was sent up to St. Bartholomew's Hospital, where he was very kindly seen by Mr. Langton, who advised me not to interfere, but to let the process of cicatrisation go on.

On 7th July there was some active inflammation in the swelling in the malar region, and a considerable amount of discharge (pus) from the outer angle of the eye, where it has been remarked that there was a slough still firmly adherent. The temperature rose to 102°. On passing a probe under the skin a large cavity was found extending 1½ inches outwards towards the ear. Two counter openings were made and the cavity was syringed out, some large sloughs being washed out. Drainage was established, and the same dressing applied.

23rd July.—Since the last date the cicatrisation of the eyelid had gone on rapidly, and the eye could be opened and shut a little. The lower lid was still swollen. The sinus was found to extend backwards and outwards to within half an inch of the ear. Another counter opening was made at this spot, and the sinus drained and dressed as before. More sloughs were removed, and then the sinus soon healed up, pressure being applied to promote adhesion of the surfaces.

On 23rd August the patient could open the eye much better, but not nearly as wide as the other one. He could almost close it, but a little of the eyeball was always visible, though the cornea was covered when he shut his eye.

He was granted 14 days' sick furlough, returning in about the same condition, and soon after joined his battalion.

The suddenness of the appearance of the severe symptoms, and the obscurity of their origin, were remarkable in this case. There was no blush, such as is usually seen in cases of erysipelas, at any period of the case; but the man was isolated, and placed in charge of a special orderly at once.

There was no sign of a deep abscess anywhere or pent-up pus.

It was suggested at St. Bartholomew's that the sloughing might have been a sequela to acute nephritis, but I do not share this opinion.

Nothing was noticed abnormal regarding the urine till partial suppression took place, and there was no reason to suspect any renal complications till then, as there was no constitutional disturbance. The primary swelling of the eyelid was strictly unilateral, and only in that region.

The incisions in the swollen tissues were made with caution, as it was feared that the sloughing action might spread to them, but the case was so urgent that they were made freely and deeply to try and relieve the extreme tension which existed.

I am inclined to believe that the sloughing of the subcutaneous tissue in the temporal region took place at the same time as that of the eyelid, and if that was the case it is remarkable that the necrosed tissues remained quiescent so long before they began to be inflamed and to come away.

The value of the perchloride of iron in reducing the albuminuria was well marked, and I also think that the free use of brandy was very useful.

There was certainly well-marked septic poisoning, but how the poison was introduced into the system I am unable to say.

APPENDIX No. XIV.

ON THE LATE EPIDEMIC OF BUBONIC PLAGUE IN SIND, AND MORE ESPECIALLY THE OUTBREAK AT KARACHI AND SUKKUR.

By Surgeon-Captain A. L. **Borradaile**, M.B., Army Medical Staff.

I shall make no attempt to discuss this epidemic from a general point of view, but shall confine myself to recording my own experiences in dealing with it, particularly in its sanitary aspects as they presented themselves to me during the period from March to July 1897, together with such conclusions regarding its prevention and suppression as I have arrived at.

My experience began on February 26th, 1897, when I landed in Karachi and took up my appointment as professional adviser to the Acting Commissioner in Sind. I found the town half depopulated, trade at a standstill, and a daily plague death-rate of about 50. The disease had been introduced from Bombay in the previous November, no effort to prevent this having been made beyond a half-hearted attempt at quarantine, though, as communication between the two places is almost entirely by sea, the circumstances were favourable for a rigorous application of the measure. The disease spread with characteristic slowness, and it was not until January that the authorities began to realise that the town was thoroughly infected. Even then the measures adopted were inadequate to meet the emergency. The sick continued to be given the option of treatment in their homes, with the natural result that but few of them went into hospital, notification of illness was not enforced, nor was any attempt made, by means of systematic house visitation, to discover concealed cases, while the exodus of the population was encouraged, with fatal results to the rest of the province. During the course of January some of the most severely affected parts of the town were emptied, and their inhabitants moved into matshed huts, situated for the most part on the right or further bank of the Syari, a dry river bed. This cannot be described as a successful measure, the transfer of the population not having been accompanied by disinfection of their clothes, bedding, &c., so that the disease was carried into the camps, where it flourished much as it had done in the town; but to this important point I shall refer more fully later on. Further, to facilitate the execution of sanitary measures, the town was divided into districts, each under the supervision of an official of responsible rank and, with one exception, of British nationality. Under these superintendents the work of cleaning and limewashing all houses and the burning of refuse was carried on zealously, and, if simple cleanliness could have sufficed to eradicate the plague, or even to prevent its effecting a lodgment in a district exposed to infection, the epidemic at Karachi would never have attained the proportions it did. Unfortunately, the failure of such sanitary measures, when taken at the eleventh hour, was manifested on so many occasions that, as a means of combating an imminent or actual invasion of plague, they must be relegated to quite a secondary place.

To me, when I arrived in Karachi at the end of February, the measures that appeared to be of the most urgent necessity, if we were to get ahead of the epidemic instead of merely following in its wake, were as follows:— The notification of all cases of suspected plague; the removal of sick to hospital, and the evacuation of the house in which the case had occurred as well as the dwellings immediately adjoining. Later on, as organisation developed, other equally important measures would become practicable, in particular the institution of house-to-house search parties, but at first even the recommendations mentioned above were not and indeed could not be acted upon. Compulsory notification was not put into force till the latter part of March, while the sick continued to a great extent to be treated in their homes. The latter fact was in a sense rendered necessary by the insufficiency of hospital accommodation. How utterly inadequate this was will be realised from the fact that the civil hospital, which had just been handed over for plague purposes, and was the only one available, was only partially equipped, that there were hardly any nurses, and that at best there was only accommodation for about 50 patients. Gradually, however, this hospital was enlarged, while others came into existence, of which many were erected and equipped by various castes for the use of members of their own communities. This was allowed as a concession to native prejudices, as it was thought, reasonably enough, that the objection on the part of the people to going into hospital would be thereby lessened. The plan is not one which can be altogether approved or condemned without qualification. Some communities, notably the Parsees, showed great enlightenment, and their hospitals met all reasonable requirements; but on the other hand there were many exceptions. In any case permission to have their own hospitals was granted to far too many communities at first, and later on it was found necessary to close a large number of them as failing to attain to even the most modest standard of hygienic requirements.

Towards the end of March the Governor of Bombay paid the town a visit, and under the stimulating influence of his presence a great modification was introduced into the plague organisation. A plague committee was appointed, consisting of four members, the General Officer Commanding being President, under which all operations were carried out. The powers of this body did not extend beyond the limits of Karachi District, but similar committees were created in all the inland towns. At the same time 300 men of the Wiltshire Regiment were allowed to volunteer for plague work, and were mostly employed in house-to-house visitation, which was now taken in hand. The method of effecting this may be here described. Very early in the morning a cordon of police or native infantry was drawn round the quarter which it was intended to search, and no one was allowed to pass out till the visit, which was always a surprise one, was terminated. The search was carried out systematically by small parties of British soldiers acting under the orders of British officials, and provided with pots of red paint to mark the houses as having been visited. Speaking generally, the visits of these inspection parties were singularly well received by natives of all classes, and particular satisfaction was always expressed that European soldiers were employed. These operations were of great benefit, not only by reason of the large number of cases actually detected, but also indirectly by makingthe people realise the worse than futility of further attempt at concealment, exposing them, as it did, to the risk of prosecution and punishment. Coincidently with this, the system of segregation of persons living in infected houses or in dwellings adjacent to such was rendered far more thorough. Matshed camps for the reception of these people had long existed, and indeed the want of a controlling central authority had led to their unnecessary multiplication. Now, however, they were largely reduced in number so as to facilitate a stricter supervision, the inmates were rationed at the public expense during their stay of ten days and prohibited from association with the outside world. All individuals and their belongings on their arrival in camp were subjected to disinfection, the duty being performed by British soldiers, and conducted more or less on the following lines. Every article of bedding, clothing, &c. was plunged into cauldrons of boiling water for half an hour, the owners themselves taking a bath containing some disinfectant. Till this process was completed they remained in certain huts specially appropriated for new arrivals. After passing through this ordeal they were allowed into the body of the camp, where they remained for ten days, provided no fresh case occurred. On leaving, the same precautionary measures were carried out as on arrival. This most important modification of the former segregation system was attended with excellent results. Previously, the transfer of families into huts had only too often proved of no benefit. In one instance where it was tried on a very large scale—2,000 people being turned out—the ratio of disease was for a long while somewhat higher amongst the evicted in their new quarters than it had been in their old pestilential homes. When, however, strict isolation of inmates, together with disinfection of all persons and effects on entry, was carried out, marked improvement followed in every case, and at Sukkur, of the epidemic at which place I had a full experience, there was not one instance of a case of plague occurring in the health camps which might not possibly have been contracted prior to admission. My connexion with the Karachi outbreak ceased early in April, when I was ordered to Sukkur to assist in dealing with the epidemic in that town. The system adopted here was in its main outlines similar to what has just been described as obtaining in Karachi after the formation of the plague committee, but I think it may be claimed for Sukkur that the scheme was executed with a thoroughness of detail not equalled elsewhere, whether in or out of Sind, and that the results were correspondingly good.

Sukkur is a town of 30,000 inhabitants, situated on the right bank of the Indus, and is a place of considerable commercial importance. Isolated cases of plague had occurred during February 1897, but it was not till nearly the middle of March that the disease assumed epidemic proportions. This it did suddenly, whereupon people fled from the town in thousands. Not much effective work was done, however, till the beginning of April, when a committee was appointed and, with outside assistance, grappled with the emergency. The condition of affairs was indeed deplorable. Of a population of 30,000 not more than 5,000 remained, and amongst these deaths were occurring at the rate of 20 per diem. As a consequence labour was almost unobtainable and provisions most difficult to get. One of the first steps was to obtain the services of 30 men of the Wiltshire Regiment from Hyderabad and with these to start house-to-house visitation. Lady nurses were obtained from a religious order in Lahore, and a hospital soon got into working order; segregation camps were instituted and very thoroughly organised, and the work of cleaning and disinfecting houses was carried out as fast as the limited supply of labour and disinfectants would permit. Disinfection, where a case had actually occurred, consisted in spraying the room all over with a 1-2000 solution of corrosive sublimate and afterwards limewashing. Fumigation was occasionally but not often resorted to. These measures were in active operation by about the 10th April, and their efficacy may be judged by the figures given below:—

Week ending	Plague Cases.	Plague Deaths.
April 7th - - - - -	109	67
„ 14th - - - - - -	80	62
„ 21st - - - - -	66	41
„ 28th - - - - - -	15	14
May 5th - - - - -	15	12

In addition, with a view to preventing the spread of disease to other parts, no one was allowed to leave the town till after a period of ten days under observation in camp. Similarly, all persons arriving from possibly infected districts were put in quarantine, and their clothes, bedding, &c., disinfected. This process was carried out at the railway station by means of steam introduced from a locomotive into a closed chamber where it was at a pressure of 140 lbs. Articles were exposed to this for 10 minutes.

On April 18th the remaining inhabitants, some 600 in number, of a very severely affected quarter, called Gharibabad, were turned into camp. They and their belongings were carefully disinfected, and not one case of plague occurred amongst them subsequently to their removal, though previously they had had three and four cases every day. A few days later a similar measure was applied to the inhabitants of New Sukkur, a district almost as intensely infected as Gharibabad, and here again the result was eminently satisfactory.

It is to be noted that in both these instances the people were not segregated, but were allowed to go into the town and transact their business, the benefit derived therefore can hardly but be attributed to the disinfection, for a simple change of abode was rarely observed to do any good.

By the end of April the epidemic was nearly suppressed, only one or two cases occurring each day, and sometimes even none. On May 7th, therefore, I left for Karachi, where I found matters very greatly improved, so that I only remained there a few days, proceeding then up country to take charge of the plague operations at Larkhana, where my experiences were merely a repetition on a smaller scale of what I have already described.

In this review of the epidemic in Sind I have only dwelt on its career in those places where I was actually stationed, but I must at least make some mention of the system of inspecting train passengers which was carried out at several points in the province. The duty was mainly entrusted to commissioned medical officers, aided, where practicable, by lady doctors, who inspected the female passengers. The measure certainly tended to check the spread of disease, but its efficacy was very limited, and was a poor substitute for the stoppage of booking from infected towns.

To sum up, the conclusions to which I have come as to the best method of dealing with an outbreak of plague in a town in India are as follows:—Notification of all cases or suspected cases must be enforced from the outset; search parties composed, if possible, of Europeans, should be instituted; all plague-stricken persons should be removed to hospital, it being of little importance from a sanitary point of view whether the hospital is entirely under European administration or merely supervised by Europeans, provided that strict isolation is maintained and adequate measures of disinfection adopted: the segregation for ten days of all inmates of an infected house, and also of those in the adjacent houses. In the case of very large dwellings this rule may need modification. To these measures must be added the disinfection of corpses and the simplification of funeral rites. As the epidemic begins to subside, care should be exercised to control immigration from infected districts, and people arriving from such should, together with all their effects, be disinfected; a few days' detention in an observation camp probably affording some additional security. Another important point to attend to is the inspection by a medical officer of every corpse before it is removed for burial or burning. This should be kept up for quite a year after the apparent subsidence of the disease, for it will afford the earliest intimation of a recrudescence, should such take place. As regards the prevention of the introduction of this disease into a town, the measures to be relied on consist in general sanitary precautions and quarantine. The importance of the former is too obvious to need to be emphasised, but there is much difference of opinion with reference to the usefulness of the latter. Perhaps the most correct view to take is that its value depends largely upon circumstances. As a protection against sea-borne infection, both *primâ facie* probability and the many recorded instances in which it seems to have secured immunity impose a grave responsibility on a Government which, through fear of interrupting commerce, refrains from applying the system in a rigorous form, unless indeed the sanitary condition of the town, and the means for carrying out the British system of inspection of ships and isolation of cases, are far ahead of anything to be found at present in Eastern communities.

Land quarantine is on quite a different footing, for the opportunities of evading it are so numerous that it is very doubtful whether the good it does counterbalances the great inconvenience it causes. I have, however, included it above among the precautionary measures to be taken, as it was very generally adopted in India, and perhaps, with modifications dictated by local conditions, it may sometimes be of benefit.

APPENDIX

Annual Abstract of Meteorological Observations taken

NETLEY. Lat. 50° 51′ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Minimum.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per Cent.	Day.
January -	30·235	41·0	41·1	34·9	47·4	25·0	20th	54·0	28th	·241	83	60	4, 9th
February -	30·219	40·4	41·2	32·7	49·7	20·0	25th	58·0	28th	·231	80	60	19th
March -	29·743	47·5	46·9	38·4	55·4	27·0	30th	66·5	22nd	·298	81	58	27th
April -	30·070	51·9	50·6	39·3	62·0	29·5	22nd	70·0	19th	·337	74	55	2nd
May -	30·102	58·0	56·4	42·0	70·8	28·2	2nd	81·2	29th	·389	67	36	29th
June -	29·850	67·3	64·2	50·2	78·3	35·3	1st	88·2	15th	·494	69	47	2nd
July -	29·919	68·5	65·9	51·0	80·8	41·8	29th	89·3	19th	·498	64	45	22, 30
August -	29·921	62·3	62·4	49·9	75·0	43·2	17, 27th	84·2	12th	·452	70	42	1st
September	29·683	59·2	59·0	50·2	67·9	35·3	21st	76·2	8th	·445	82	66	28th
October -	29·654	48·1	48·1	38·1	58·1	26·0	28, 29th	70·0	2nd	·319	80	43	31st
November	30·025	39·3	39·5	31·4	47·6	24·0	30th	53·2	20th	·227	81	52	7th
December -	29·693	40·2	39·3	32·6	46·0	24·0	17th	56·0	28th	·242	87	72	25th
Year -	29·926	52·0	51·2	40·9	61·6	20·0	25th Feby.	89·3	19th July	·348	76	36	29th May

GIBRALTAR. Lat. 36° 6′ 20″ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Minimum.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per Cent.	Day.
January -	30·114	54·0	57·3	51·9	62·6	41·2	15th	71·6	26th	·355	78	56	6, 26
February -	30·031	54·2	56·2	51·8	60·6	45·6	3rd	65·2	21st	·341	76	48	25th
March -	29·959	56·7	59·1	52·4	65·7	47·6	9th	74·8	28th	·382	76	52	8th
April -	30·041	60·7	62·0	56·0	67·9	48·0	5th	80·6	13th	·389	69	40	29th
May -	29·951	64·7	65·9	59·8	72·0	55·0	14th	79·0	21st	·450	69	47	4, 21st
June -	30·004	69·8	70·6	63·6	77·6	51·4	11th	86·0	19, 24th	·480	61	35	19th
July -	29·987	73·6	75·4	68·4	82·3	65·0	25, 26th	86·8	7th	·555	61	29	6th
August -	29·959	72·2	73·6	67·5	79·6	64·0	1st	88·0	19th	·569	67	39	10th
September	30·001	72·1	73·7	66·8	80·6	56·4	28th	90·4	25th	·545	65	32	25th
October -	29·965	62·1	64·2	58·1	70·3	48·8	24th	83·0	5th	·422	70	36	14th
November	29·995	53·7	57·0	50·5	63·4	46·0	10th	69·0	14th	·340	75	51	9th
December -	30·111	51·8	55·3	49·0	61·6	41·0	21st	69·2	27th	·334	78	47	20th
Year -	30·010	62·1	64·2	58·0	70·3	41·0	21st Dec.	90·4	25th Sept.	·430	70	29	6th July

MALTA. Lat. 35° 53′ 49″ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Minimum.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per Cent.	Day.
January -	29·924	53·6	53·3	50·5	56·1	45·2	8th	63·8	1st	·281	66	43	5th
February -	30·005	55·4	55·4	51·8	59·0	45·6	18th	62·6	21st	·324	72	53	17th
March -	29·836	58·9	58·9	55·7	62·1	50·2	14th	66·6	28th	·374	74	59	4th
April -	29·688	58·2	60·2	56·0	64·5	47·0	29th	75·6	9th	·357	72	56	26th
May -	29·759	63·7	65·6	58·9	72·4	54·4	1st	80·0	11th	·430	71	45	16th
June -	29·793	71·2	71·2	65·9	76·5	60·0	5th	84·2	28, 29th	·556	70	40	25th
July -	29·808	79·0	78·8	73·6	84·1	67·0	1st	94·5	19th	·622	60	31	19th
August -	29·824	78·8	79·1	74·3	84·0	65·0	31st	96·8	11th	·643	63	38	15th
September	29·836	76·6	76·5	72·3	80·7	65·0	29th	86·5	5th	·616	67	43	26th
October -	29·889	73·2	72·0	68·0	76·0	51·0	23rd	83·0	20th	·587	71	45	1st
November	29·767	65·8	66·3	62·2	70·4	53·6	18th	82·0	15th	·449	69	50	24th
December -	29·798	59·0	58·7	55·2	62·2	49·8	30th	69·2	7th	·379	72	56	29th
Year -	29·823	66·1	66·3	62·0	70·7	45·2	8th Jan.	96·8	11th Aug.	·471	69	31	19th July

No. XV.

at Netley and Stations Abroad in the Year 1896.

Long. 1° 20′ W. Height of Barometer Cistern above Sea, 47 feet.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.								
				Number of Days of								Number of Observations under each Point per Month.								
	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
8·0	1·04	0·33	25th	7	—	—	—	1	—	16	—	8	15	5	4	3	16	5	5	1
7·1	0·44	0·16	20th	5	—	—	—	2	2	14	—	10	13	3	4	4	12	6	6	—
7·1	3·51	0·95	20th	19	—	—	1	1	—	12	5	4	8	1	4	5	24	8	8	—
6·7	0·71	0·23	13th	8	—	—	—	—	1	10	1	6	13	1	2	9	10	7	11	1
4·4	0·39	0·20	21st	3	—	—	—	—	4	3	—	6	33	5	4	3	2	2	6	1
5·6	2·73	0·99	25th	13	—	—	5	—	2	6	—	2	9	3	5	9	16	5	11	—
4·8	0·74	0·25	26th	7	—	—	—	—	3	6	—	4	4	1	5	9	18	5	12	4
6·8	2·44	0·75	30th	12	—	—	1	—	—	10	—	8	7	3	3	2	16	6	17	—
7·8	7·79	1·31	24th	24	—	—	1	—	—	18	3	2	4	1	1	8	28	6	10	—
6·6	3·23	1·23	6th	16	—	1	1	—	—	13	3	8	11	—	—	1	19	4	17	2
6·5	1·01	0·49	14th	8	—	—	—	2	1	11	—	5	32	3	2	—	3	3	11	1
7·9	4·83	0·90	13th	20	—	—	—	1	—	15	1	6	10	4	4	8	11	7	10	2
6·6	28·86	1·31	24th Sept.	142	—	1	9	7	13	134	13	69	159	30	33	61	175	64	124	12

Long. 5° 20′ 53″ W. Height of Barometer Cistern above Sea, 52 feet.

Mean Amount of Cloudiness.	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
5·5	5·82	3·40	11th	6	—	—	—	—	8	10	7	2	1	40	—	—	4	8	6	1
5·0	3·18	1·79	1st	9	—	—	—	—	4	6	5	2	1	39	1	—	2	3	9	1
3·5	2·78	2·03	14th	6	—	—	1	1	11	5	2	—	2	22	—	2	5	18	8	5
3·5	0·93	0·79	4th	5	—	—	—	—	12	2	—	—	1	40	3	1	4	3	1	7
3·5	1·59	0·55	27th	10	—	—	4	—	6	—	—	—	1	28	1	—	4	21	3	4
2·5	0·08	0·08	8th	1	—	—	—	—	13	—	3	—	—	25	1	—	2	27	4	1
2·5	—	—	—	—	—	—	—	—	14	—	3	—	—	22	—	—	8	28	—	4
3·0	—	—	—	—	—	—	—	—	10	1	4	—	—	40	—	—	—	19	—	3
3·0	0·14	0·11	9th	2	—	—	—	—	14	2	—	—	—	23	—	—	—	31	—	6
4·5	4·03	2·10	18th	8	—	—	—	—	7	4	2	1	—	27	1	—	1	14	15	3
4·0	6·80	1·68	23rd	9	—	—	—	—	9	6	2	—	2	16	1	—	5	16	19	1
4·0	4·40	1·08	1st	11	—	—	1	—	13	7	4	2	—	8	—	—	15	15	21	1
3·7	29·75	3·40	11th Jan.	67	—	—	6	1	121	43	32	7	8	330	8	3	50	203	86	37

Long. 14° 30′ 54″ E. Height of Barometer Cistern above Sea, 112 feet.

Mean Amount of Cloudiness.	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
6·7	2·90	1·63	25th	14	—	—	1	—	—	3	—	9	19	1	5	—	4	7	17	—
6·5	1·87	0·65	4th	10	—	—	—	—	—	6	—	4	20	2	6	1	5	3	17	—
6·5	1·35	0·35	11th	10	—	—	—	—	—	6	—	2	5	5	14	—	5	6	24	1
6·3	3·39	0·90	10th	13	—	—	3	—	—	5	—	2	13	4	2	2	4	6	27	—
3·9	1·13	0·38	24th	6	—	—	1	—	7	1	—	6	12	12	2	1	2	7	20	—
2·8	—	—	—	—	—	—	—	—	3	6	—	10	7	3	17	1	3	4	15	—
1·4	—	—	—	—	—	—	—	—	12	2	—	6	13	3	6	—	6	8	20	—
2·6	·001	·001	28th	1	—	—	—	—	14	—	—	3	4	4	15	7	6	4	19	—
2·8	0·02	0·02	26th	2*	—	—	2	—	9	1	—	6	8	2	14	1	9	2	18	—
5·9	2·34	1·42	3rd	5*	—	—	4	—	—	6	—	7	11	8	19	4	4	3	6	—
6·2	5·07	3·07	24th	15	—	—	2	—	1	2	—	—	3	3	1	10	12	21	9	1
6·9	3·41	1·48	25th	13	—	—	1	—	—	8	—	—	9	—	6	—	16	2	18	11
4·9	21·48	3·07	24th Nov.	89	—	—	14	—	46	46	—	55	124	47	107	27	76	73	210	13

* September and October. 1 day's rain not registered.

Appendix

Annual Abstract of Meteorological Observations taken

SCUTARI CEMETERY. Lat. 41° N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean Daily.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Minimum.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per Cent.	Day.
January -	29·998	36·9	37·4	33·2	41·7	26·2	30th	51·2	16th	·188	82	63	16th
February -	30·130	36·7	37·8	31·8	43·8	23·8	18th	54·8	28th	·187	78	55	27th
March -	29·889	45·1	46·5	38·3	54·7	30·2	2nd	66·0	29th	·239	71	45	3rd
April - -	29·873	49·6	50·4	41·4	59·5	30·4	11th	75·4	29th	·273	70	40	23rd
May - -	29·804	61·2	61·1	50·4	71·9	40·8	15th	81·6	29th	·388	66	40	8th
June -	29·821	71·4	71·5	59·7	83·4	51·8	2nd	91·4	29th	·494	58	34	25th
July - -	29·797	76·5	76·4	64·3	88·5	59·2	2nd, 7th	93·6	31st	·551	54	30	14th
August -	29·800	78·7	80·7	67·5	93·9	57·8	20th	107·6	13th	·564	52	27	12th
September	29·810	72·8	72·9	62·6	83·2	54·6	24th	92·2	27, 28th	·506	57	33	27th
October -	29·991	67·1	67·7	58·9	76·5	46·0	18th	83·0	22nd	·489	67	45	22nd
November	29·958	54·9	55·6	48·9	62·3	26·8	30th	78·0	2nd	·329	70	50	9th
December -	29·990	46·2	47·2	42·1	52·4	24·0	1st	64·6	8th	·270	79	56	1st
Year -	29·905	58·1	58·8	49·9	67·6	23·8	18th Feb.	107·6	13th Aug.	·373	67	27	12th Aug.

POLYMEDIA, CYPRUS. Lat. 34° 42½′ N.

January -	29·432	51·4	52·7	43·9	61·5	34·0	30th	69·2	3rd	·293	71	49	15th
February -	29·570	53·0	54·1	43·3	64·8	32·4	5th	72·1	25th	·288	63	44	27th
March -	29·399	59·1	58·5	47·9	69·1	39·0	3rd	74·3	18th	·352	65	37	18th
April - -	29·446	66·1	62·9	49·8	76·0	37·2	11th	92·2	26th	·342	51	26	30th
*May - -	29·335	73·0	70·6	56·9	84·3	51·2	16th	93·4	8th	·469	54	33	8th
June - -													
July - -													
August -													
September													
October -													
November†	29·486	66·6	66·1	55·0	77·1	51·6	25, 26th	84·1	11th	·401	60	36	19th
December -	29·580	62·0	62·5	52·1	72·8	45·2	2nd	80·5	21st	·353	61	37	22nd

* 20 days only. † 22 days only.

TROODOS, CYPRUS. Lat. 34° 54′ N.

January -													
February -													
March -													
April - -													
May - -													
June -	*24·27	64·5	64·0	51·7	76·2	40·0	6th	91·3	12th	·277	44	23	14th
July - -	24·20	68·2	68·4	56·0	80·7	46·4	31st	87·7	3rd	·328	44	26	4th
August -	24·23	74·5	75·4	63·0	87·8	56·2	1st	95·6	21st	·350	38	24	24th
September	24·19	63·0	64·0	52·8	75·1	46·2	24th	87·5	7th	·367	61	29	29th
October -	24·28	57·1	56·8	47·5	66·0	36·0	18th	74·3	11th	·268	55	33	6th
November													
December -													

* Aneroid.

No. XV.—*continued.*

at Netley and Stations Abroad in the year 1896.

Long. 29° 3′ E. Height of Barometer Cistern above Sea, 60 feet.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.								
				Number of Days of								No. of Observations under each Point per Month.								
	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
8·5	6·10	1·26	18th	19	12	—	—	—	1	22	—	14	30	4	2	2	4	—	1	5
6·0	0·84	0·18	21st	12	12	1	—	1	4	13	—	10	15	9	1	3	11	1	—	8
5·0	2·34	0·95	31st	10	1	1	1	3	7	11	—	3	15	8	8	11	5	—	2	10
5·0	1·86	0·43	15th	16	3	2	2	—	7	8	—	5	19	3	1	21	6	—	1	4
4·5	0·25	0·12	1st	5	—	—	2	2	5	4	—	4	28	2	1	11	9	1	1	5
3·5	0·25	0·10	14th	4	—	—	1	2	10	3	—	5	20	3	1	6	19	1	—	5
3·0	—	—	—	—	—	—	1	4	15	1	—	10	29	1	1	3	14	—	—	4
2·0	0·52	0·50	19th	2	—	—	1	2	15	—	—	6	34	6	—	6	5	—	—	5
4·5	1·82	1·15	30th	3	—	—	5	—	4	4	—	5	31	4	2	9	4	—	—	5
4·0	0·65	0·58	1st	4	—	—	2	—	11	3	—	3	22	13	—	6	5	—	1	12
6·5	3·17	0·61	12th	15	2	—	—	—	1	8	—	5	16	10	2	4	14	2	—	7
7·0	4·03	1·75	16th	19	2	—	2	2	3	14	—	5	23	6	5	4	12	—	—	7
5·0	21·83	1·75	16th Dec.	109	32	4	17	16	83	91	—	75	282	69	24	86	108	5	6	77

Long. 30° 1′ E. Height of Barometer Cistern above Sea, 460 feet.

5·5	11·81	1·66	16th	16	—	2	5	—	4	12	—	4	—	4	—	2	6	15	16	15
4·5	2·25	1·10	21st	6	—	—	1	—	8	5	—	4	2	5	1	1	2	19	5	19
4·5	1·84	0·68	21st	10	—	—	1	—	6	1	—	8	3	3	1	3	4	21	7	12
3·5	0·04	0·04	7th	1	—	—	—	—	8	1	—	4	2	1	4	3	3	20	13	10
3·5	0·06	0·06	13th	1	—	—	—	—	6	1	—	—	1	1	4	1	5	10	7	11
4·5	2·24	1·30	27th	6	—	—	3	—	3	2	—	3	1	3	3	—	1	10	10	9
4·0	1·28	0·53	3rd	7	—	—	1	—	6	2	—	5	4	3	10	—	—	6	8	26

Long. 32° 53′ E. Height of Barometer Cistern above Sea, 5,700 feet.

1·5	0·18	0·18	24th	1	—	—	1	—	18	—	—	8	1	—	—	4	4	10	9	24
1·0	2·79	2·05	30th	3	—	1	2	—	23	—	—	7	—	—	—	4	3	23	8	17
0·5	—	—	—	—	—	—	—	—	30	—	—	2	—	—	—	4	6	11	7	32
2·5	0·96	0·42	14th	4	—	2	2	—	12	1	—	2	—	—	—	—	—	13	3	12
2·0	—	—	—	—	—	—	—	—	17	—	—	8	4	—	—	—	—	4	7	39

Appendix

Annual Abstract of Meteorological Observations taken

FORT NAPIER, NATAL. Lat. 39° 3′ S.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Min.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per Cent.	Day.
January -	27·607	76·8	75·2	62·6	87·8	48·0	20th	103·0	24th	·627	65	35	3, 21
February -	27·649	76·4	76·9	63·9	90·0	58·8	27th	106·0	11th	·664	63	41	18th
March -	27·650	76·7	76·8	63·5	90·1	57·8	3rd	107·8	4th	·610	63	36	3,4,11, 13th
April -	27·761	68·3	69·2	57·9	80·5	46·4	8th	95·6	3rd	·513	67	34	9th
May -	27·793	64·1	63·9	48·7	79·1	40·2	14th	89·4	2nd	·383	59	32	16, 21,
June -	27·760	62·4	60·3	46·9	73·7	34·2	21st	82·2	6th	·363	57	33	3, 25, 29th
July -	27·781	61·4	58·8	42·6	75·0	34·2	25th	93·8	29th	·319	51	32	20, 21,
August -	27·821	64·8	64·7	50·7	78·7	40·2	23rd	94·6	31st	·383	56	32	19th
September	27·713	67·5	67·0	52·2	81·9	40·2	3rd	104·2	16th	·391	53	32	1, 4, 11
October -	27·382	72·1	71·1	57·5	84·7	47·4	2nd	104·4	3rd	·486	58	33	1, 4, 15
November	27·691	70·6	70·8	58·2	83·4	46·0	9th	101·2	2nd	·482	63	35	3, 23,
December	27·650	74·9	75·0	63·9	86·2	58·4	25th	104·5	13th	·604	68	36	13th
Year -	27·688	69·7	69·1	55·7	82·6	34·2	21st June, 25th July.	107·8	4th Mar.	·485	61	32	16, 21 May, 20, 21 July, 19th Aug. 1, 4, 11 Sept.

SIERRA LEONE. Lat. 8° 29′ 30″ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Mean at 9 a.m.	Mean daily.	Means of Min.	Means of Max.	Abs. Min. Temp.	Abs. Min. Day.	Abs. Max. Temp.	Abs. Max. Day.	Tension of Vapour.	Relative Humidity Per Cent. Mean.	Min. Per Cent.	Min. Day.
January -	29·735	81·7	80·9	74·3	87·5	71·8	6th	92·2	24th	·816	71	57	31st
February -	29·718	83·1	82·0	74·9	89·2	72·2	24th	95·8	26th	·732	63	43	13th
March -	29·707	83·1	82·0	74·5	89·6	71·2	5th	99·8	29th	·709	62	36	5th
April -	29·713	83·1	84·0	76·3	91·7	70·4	28th	95·0	24th	·809	63	46	4th
May -	29·729	83·6	82·3	74·8	89·9	69·0	29, 31st	94·0	6th	·834	70	50	14th
June -	29·768	80·8	80·3	73·6	87·1	69·9	6th	92·0	6th	·848	79	68	3, 6th
July -	29·775	79·2	79·1	73·5	84·8	70·8	30th	87·4	21st	·833	82	63	13th
August -	29·760	77·8	78·0	72·4	83·6	70·0	17th	87·4	1st	·782	80	53	17th
September	29·708	78·8	79·1	73·1	85·2	70·2	12th	89·6	26th	·825	81	58	8th
October -	29·692	79·8	80·1	72·6	87·6	70·0	20, 26th	91·0	30th	·836	78	60	24th
November	29·659	82·3	82·2	74·9	89·5	70·0	5, 27th	93·9	26th	·875	75	67	7,15,1
December	29·673	81·4	82·3	75·5	89·1	70·0	30th	92·8	16th	·768	66	34	28, 29
Year -	29·720	81·4	81·0	74·2	87·9	69·0	29, 31st May.	99·8	29th Mar.	·807	72	34	28, 29 Dec.

BARBADOS. Lat. 13° 7′ 39″ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Mean at 9 a.m.	Mean daily.	Means of Min.	Means of Max.	Abs. Min. Temp.	Abs. Min. Day.	Abs. Max. Temp.	Abs. Max. Day.	Tension of Vapour.	Relative Humidity Per Cent. Mean.	Min. Per Cent.	Min. Day.
January -	30·211	80·1	74·0	62·0	86·1	56·4	29th	87·8	22nd	·702	67	53	29t
February -	30·085	79·8	75·3	65·1	85·6	55·8	1st	88·6	28th	·664	62	50	25th
March -	30·047	81·1	76·7	66·8	86·6	62·6	20th	88·2	7, 18th	·662	60	43	11t
April -	30·031	83·4	78·0	68·5	87·5	65·2	13th	89·4	13th	·692	61	43	5t
May -	30·033	83·1	78·7	69·9	87·5	67·5	1, 23, 31	89·2	19, 20th	·768	71	58	9th
June -	30·073	80·4	78·6	70·1	87·4	67·0	23rd	88·8	25, 26th	·803	70	56	2nd
July -	30·094	82·6	78·6	69·2	88·0	67·2	3rd	89·8	31st	·822	70	59	5th
August -	30·085	84·6	79·1	69·5	88·8	67·8	21st	91·6	29th	·829	68	56	22nd
September	30·003	84·1	79·1	69·1	89·1	65·8	8th	90·0	16, 29th	·833	70	55	1st
October -	30·006	83·7	78·1	68·0	88·2	65·8	19th	90·8	4, 8th	·835	70	54	[illegible]
November	29·927	83·4	76·7	67·0	86·4	63·6	13th	89·8	19th	·852	79	59	7t
December	29·878	83·7	76·5	67·0	86·1	65·2	20, 22, 24	87·8	1st, 2nd	·847	78	51	[illegible]
Year -	30·040	82·5	77·4	67·7	87·3	53·8	1st Feb.	91·6	29 Aug.	·776	69	43	11th Ma 5 A

No. XV.—*continued.*

at Netley and Stations Abroad in the Year 1896.

Long. 30° 2′ E. Height of Barometer Cistern above Sea, 2,220 feet.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.								
				Number of Days of								Number of Observations under each Point per Month.								
	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
5·0	5·84	1·25	17th	15	—	1	8	1	8	7	1	—	1	—	1	—	—	—	2	58
4·3	5·27	1·63	21st	19	—	—	7	1	7	5	3	—	—	4	—	—	—	—	—	54
4·1	3·50	1·40	22nd	14	—	—	6	1	12	5	1	—	—	—	—	—	—	—	1	61
5·1	2·15	0·58	6th	15	—	—	4	1	5	5	—	—	2	—	—	—	—	—	—	53
2·9	1·63	0·88	25th	3	—	—	1	—	15	5	1	—	—	—	—	—	1	—	1	60
2·8	0·40	0·20	4,16	2	—	—	—	—	16	3	—	—	—	—	—	—	—	—	—	60
1·2	0·04	0·02	7, 31	2	—	—	—	—	20	—	—	—	—	—	2	—	—	—	—	60
3·0	1·93	0·96	22nd	7	—	—	2	1	18	5	—	1	1	—	—	—	1	—	—	59
3·2	0·81	0·59	1st	5	—	—	—	—	13	4	—	—	1	—	—	—	—	—	—	59
4·2	2·60	0·94	16th	10	—	—	3	—	8	5	—	—	1	1	3	—	1	—	—	53
6·6	5·23	1·01	19th	20	—	1	10	—	4	12	—	1	—	4	1	—	1	—	2	51
7·6	9·03	5·24	17th	17	—	—	4	—	—	15	—	—	1	1	1	—	—	—	—	59
4·2	38·43	5·24	17th Dec.	129	—	2	45	5	126	71	6	2	7	10	8	—	4	—	6	695

Long. 13° 9′ 17″ W. Height of Barometer Cistern above Sea, 224 feet.

Mean Amount of Cloudiness.	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
2·9	—	—	—	—	—	—	—	—	4	—	—	3	2	6	3	10	5	14	2	17
2·5	—	—	—	—	—	—	—	—	4	—	—	1	—	6	3	8	10	20	—	10
2·7	0·74	0·46	13th	4	—	—	1	—	5	—	—	1	—	3	1	17	15	17	—	8
2·9	3·50	2·00	24th	8	—	—	6	—	4	—	—	1	—	6	3	11	8	21	1	9
3·2	19·26	7·00	19th	17	—	—	13	—	1	—	—	5	1	11	4	15	1	14	—	11
3·5	25·56	7·23	14th	26	—	—	11	—	2	—	—	2	—	5	3	4	6	20	1	19
3·1	46·23	7·32	2nd	25	—	—	7	—	2	—	—	6	—	1	2	12	7	19	2	13
2·7	46·96	10·07	3rd	21	—	—	2	—	4	—	—	4	—	3	2	8	7	16	—	22
2·9	31·64	5·51	15th	27	—	—	19	—	2	—	—	3	—	7	2	10	6	18	1	13
2·8	24·28	9·89	1st	27	—	—	28	—	1	—	—	5	6	3	4	6	5	7	2	19
3·0	5·15	1·03	4th	12	—	—	14	—	1	—	—	4	4	10	1	5	2	15	6	13
2·5	0·23	0·18	13th	3	—	—	4	—	2	—	—	8	3	16	2	1	—	12	2	13
2·9	203·55	10·07	3rd Aug.	170	—	—	105	—	32	—	—	43	16	82	30	107	72	193	17	172

Long. 59° 40′ 8″ W. Height of Barometer Cistern above Sea, 30⅔ feet.

Mean Amount of Cloudiness.	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
5·9	2·27	0·95	13th	13	—	—	—	—	—	1	—	1	43	8	9	—	—	—	—	1
5·3	1·71	0·53	29th	15	—	—	—	—	1	2	—	—	6	43	7	—	—	—	—	2
4·6	1·26	0·53	1st	10	—	—	—	—	1	1	—	—	18	33	11	—	—	—	—	5
5·4	4·78	1·66	25th	15	—	—	—	—	—	3	—	—	15	27	17	—	—	—	—	1
5·7	4·19	0·80	31st	19	—	—	—	—	—	3	—	—	2	13	40	—	—	—	—	7
5·5	6·26	1·43	18th	21	—	—	—	—	—	1	—	—	4	16	32	1	—	—	—	7
5·3	5·59	0·83	2nd	24	—	—	1	—	—	1	—	—	2	24	28	—	—	—	—	8
4·8	5·42	0·97	30th	24	—	—	—	—	—	1	—	—	1	27	17	—	1	—	—	16
4·4	5·07	1·47	6th	21	—	—	—	—	1	3	—	—	5	6	19	—	—	—	—	30
5·1	5·50	1·24	30th	18	—	—	4	—	—	3	—	—	5	8	14	3	—	—	—	32
6·3	15·12	1·97	24th	25	—	—	3	—	—	10	—	—	15	20	15	2	—	—	—	8
5·6	11·64	2·67	6th	18	—	—	1	—	—	2	—	—	14	21	23	2	—	—	—	2
5·3	63·81	2·67	6th Dec.	223	—	—	9	—	3	31	—	1	125	246	232	8	1	—	—	119

Appendix

Annual Abstract of Meteorological Observations taken

UP PARK CAMP, JAMAICA. Lat. 17° 59′ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Min.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per Cent.	Day.
January -	29·830	81·9	78·7	67·1	90·3	61·0	15th	94·9	29th	·732	62	42	25th
February -	29·834	81·9	78·9	67·9	89·9	64·3	5th	98·3	12th	·699	60	40	16th
March -	29·815	83·1	79·6	67·6	91·6	64·1	5, 6th	96·3	22nd	·714	60	43	13th
April -	29·849	83·4	80·1	68·3	92·0	64·0	13th	96·4	12th	·718	59	43	6th
May - -	29·761	84·8	81·7	71·7	91·7	69·4	3rd	97·0	5th	·786	63	43	11th
June - -	29·762	88·4	84·2	74·1	94·4	70·1	1st	101·5	29th	·761	56	36	16th
July -	29·797	88·0	84·6	74·2	95·0	72·0	4th	100·1	22nd	·750	57	34	22nd
August -	29·745	88·7	86·3	73·8	98·7	71·3	21st	100·1	3rd	·754	58	39	22nd.
September	29·068	87·9	83·9	74·0	93·9	72·2	24th	101·6	8th	·796	62	45	5, 12,
October -	29·682	87·5	84·1	73·3	95·0	70·7	28th	100·2	19th	·804	64	47	18th
November	29·700	85·9	82·6	71·1	94·1	68·1	28th	97·4	17th	·720	53	42	21st
December -	29·741	83·8	82·8	72·6	93·1	66·1	30th	96·8	6, 7th	·741	61	47	13th
Year -	29·765	85·4	82·3	71·3	93·3	61·0	15th Jan.	101·6	8th Sept.	·748	60	34	22nd July.

NEWCASTLE, JAMAICA. Lat. 18° 0′ 6″ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Mean at 9 a.m.	Mean daily.	Means of Min.	Means of Max.	Abs. Min. Temp.	Abs. Min. Day.	Abs. Max. Temp.	Abs. Max. Day.	Tension of Vapour.	Relative Humidity Per Cent. Mean.	Min. Per Cent.	Min. Day.
January -	26·323	68·9	62·7	50·4	75·1	47·6	14, 31st	80·6	25th	·511	75	54	3rd
February -	26·317	68·4	62·5	50·4	74·7	47·8	2nd	79·6	14th	·522	75	51	12th
March -	26·335	69·6	63·2	50·6	75·9	46·8	2nd	82·6	6th	·540	75	45	4th
April -	26·322	68·8	62·3	50·6	74·1	48·2	12th	78·4	25th	·549	73	53	5th
May -	26·339	72·4	64·8	53·3	76·4	49·8	21st	82·0	31st	·601	77	61	3, 21
June -	26·338	75·9	68·0	55·0	81·1	50·6	3rd	84·8	24th	·610	70	57	23rd
July -	26·331	74·7	67·9	55·7	80·2	43·4	2nd	85·0	23rd	·601	70	56	11th
August -	26·326	77·0	68·4	56·3	80·5	54·4	5th	85·0	20th	·610	69	52	22nd
September	26·320	76·1	68·2	56·7	79·8	54·2	26th	86·2	17th	·648	75	56	7th
October -	26·317	76·6	68·3	55·9	80·8	53·0	31st	87·0	11th	·639	72	46	13th
November -	26·325	74·2	66·1	53·8	78·3	51·8	14th	82·4	7th	·565	66	48	25th
December -	26·314	71·3	65·1	52·9	77·3	49·8	18th	84·0	11th	·546	73	56	3, 4, 6, 11th
Year	26·326	72·8	65·6	53·5	77·8	43·4	2nd July.	87·0	11th Oct.	·578	73	45	4th Mar.

ST. LUCIA. Lat. 14° 0′ 13″ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Mean at 9 a.m.	Mean daily.	Means of Min.	Means of Max.	Abs. Min. Temp.	Abs. Min. Day.	Abs. Max. Temp.	Abs. Max. Day.	Tension of Vapour.	Relative Humidity Per Cent. Mean.	Min. Per Cent.	Min. Day.
January -	29·182	75·7	76·0	69·7	82·3	66·0	31st	84·4	7th	·666	73	63	6, 28
February -	29·451	76·1	76·1	69·5	82·7	66·0	1st	86·0	28th	·622	69	59	20th
March -	29·182	77·0	76·9	71·7	82·1	66·0	1st	84·0	7th	·673	68	53	9, 10
April* -	29·128	76·9	—	—	82·6	—	—	85·0	23, 27, 28	·693	71	50	4th
May* -	29·146	78·5	—	—	84·7	—	—	86·8	30th	·792	76	60	19th
June* -	29·178	79·2	—	—	84·2	—	—	86·8	12th	·800	77	57	21st
July -	29·189	78·7	78·8	72·7	84·8	70·0	30th	86·6	25th	·787	76	54	2nd
August -	29·220	79·2	79·3	73·2	85·5	72·0	28th	87·0	26th	·810	76	63	27th
September	29·131	80·0	79·5	73·0	86·1	70·0	19th	88·2	29th	·822	79	62	25th
October -	29·127	80·6	79·8	72·4	87·3	70·0	12, 18th	89·2	11th	·811	73	62	5th
November -	29·081	77·9	77·5	70·6	84·4	68·2	27th	87·6	16th	·834	84	72	12th
December -	29·167	77·7	75·3	71·8	83·0	69·2	30th	85·2	3rd	·750	77	63	27th
Year -	29·182	78·1	—	—	84·1	—	—	89·2	11th Oct.	·755	75	50	4th Apr.

* Minimum Thermometer defective.

No. XV.—*continued.*

at Netley and Stations Abroad in the Year 1896.

Long. 76° 56′ W. Height of Barometer Cistern above Sea, 245 feet.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.								
				Number of Days of								Number of Observations under each Point per Month.								
	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
4·4	2·27	1·12	17th	5	—	—	—	—	5	5	—	1	6	—	31	—	12	1	7	4
4·9	2·27	1·17	17th	5	—	—	—	—	1	6	—	—	6	—	35	1	13	—	3	—
4·5	0·51	0·18	18th	5	—	—	—	—	4	7	—	2	4	—	38	2	6	2	3	5
4·9	0·53	0·20	19th	6	—	—	—	—	1	11	—	—	4	—	25	4	9	5	5	8
5·9	4·09	0·75	27th	12	—	—	1	—	1	15	—	1	2	—	30	3	6	1	2	17
3·9	0·53	0·47	29th	3	—	—	1	—	1	1	—	—	2	1	42	3	2	3	1	6
5·3	0·54	0·25	17th	4	—	—	2	—	—	10	—	3	3	—	35	1	4	2	8	6
4·3	1·64	0·34	13th	11	—	—	3	—	1	5	—	4	12	—	19	2	10	4	10	1
5·8	4·48	1·80	21st	12	—	—	2	—	—	8	—	—	7	—	32	5	9	—	4	3
6·0	2·56	1·50	22nd	8	—	—	1	—	—	4	—	—	18	—	27	1	9	1	4	2
4·3	2·15	0·70	22nd	8	—	—	—	—	—	1	—	1	7	—	22	—	17	2	9	2
3·5	2·05	1·64	21st	10	—	—	—	—	1	4	—	9	11	1	18	3	12	4	4	—
4·8	23·62	1·80	21st Sep.	89	—	—	10	—	15	77	—	21	82	2	354	25	109	25	60	54

Long. 76° 0′ 42″ W. Height of Barometer Cistern above Sea, 3,800 feet.

5·7	7·18	1·65	5th	17	—	—	—	—	—	5	—	6	8	4	1	—	—	—	8	35
5·1	8·30	3·10	17th	17	—	—	—	—	—	2	—	9	10	7	4	—	—	1	6	21
5·0	7·69	2·77	21st	15	—	—	—	—	5	2	—	6	5	3	2	—	—	—	7	39
5·4	5·98	1·37	22nd	19	—	—	—	—	1	—	—	11	12	—	—	—	—	—	11	26
6·1	14·98	2·17	24th	25	—	—	3	—	1	3	—	1	18	2	—	—	—	—	3	43
3·8	5·82	1·85	29th	12	—	—	2	—	6	—	1	1	15	3	4	—	—	—	—	37
4·8	4·87	2·58	17th	14	—	—	6	—	1	—	—	—	13	4	6	—	—	—	3	36
4·6	2·51	·92	26th	12	—	—	8	—	2	—	—	2	3	—	11	—	—	—	2	44
4·8	9·08	1·90	10th	21	—	—	8	—	5	1	—	—	10	2	15	—	—	—	—	33
5·1	17·69	4·25	1st	22	—	—	3	—	2	1	—	4	16	4	3	—	—	—	3	32
4·5	7·88	3·03	22nd	20	—	—	—	—	4	1	—	4	15	1	2	—	—	—	7	31
5·2	9·46	1·69	26th	19	—	—	—	—	2	5	—	4	16	1	—	—	—	—	2	39
5·0	101·44	4·25	1st Oct.	213	—	—	25	—	29	20	1	48	136	31	48	—	—	1	52	416

Long. 61° 0′ 25″ W. Height of Barometer Cistern above Sea, 744 feet.

4·0	5·53	1·45	12th	21	—	—	—	—	—	5	—	—	54	6	12	—	—	—	—	—
4·0	2·92	0·35	5th	23	—	—	—	—	—	3	—	—	58	—	—	—	—	—	—	—
3·0	6·82	1·94	21st	20	—	—	—	—	—	3	—	5	43	7	5	—	—	—	2	—
4·0	13·07	2·24	24th	28	—	—	—	—	—	2	—	17	31	7	5	—	—	—	—	—
3·0	12·40	2·75	21st	19	—	—	—	—	—	2	—	—	8	16	38	—	—	—	—	—
4·0	14·30	4·10	28th	20	—	—	3	—	—	2	—	—	23	26	11	—	—	—	—	—
4·0	10·96	1·14	30th	29	—	—	1	—	—	—	—	6	17	19	20	—	—	—	—	—
3·0	7·92	1·36	5th	26	—	—	—	—	—	—	—	7	18	30	7	—	—	—	—	—
3·0	7·14	2·00	19th	23	—	—	4	—	—	2	—	—	4	25	29	—	—	2	—	—
2·5	4·88	1·86	22nd	16	—	—	2	—	—	—	—	—	18	19	25	—	—	—	—	—
5·0	*—	—	—	29	—	—	6	—	—	5	—	—	37	19	3	—	—	1	—	—
4·5	10·90	1·80	7th	26	—	—	—	—	—	15	—	—	27	33	2	—	—	—	—	—
3·7	—	—	—	280	—	—	16	—	—	39	—	35	338	207	147	—	—	3	2	—

* Rain gauge defective, 20th and 21st.

Appendix

Annual Abstract of Meteorological Observations taken

BERMUDA. Lat. 32° 17′ 40″ N.

Month.	Mean Pressure corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean Daily.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Min.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per Cent.	Day.
January -	29·915	61·0	60·9	56·7	65·1	46·8	6th, 7th	71·9	1st	·435	78	58	15th
February	29·867	63·1	62·1	57·5	66·8	45·8	22nd	74·1	9th	·473	78	59	1st
March -	29·887	63·5	62·3	57·5	67·1	47·0	5th	73·1	20th	·510	83	65	9th
April -	29·997	65·5	63·7	58·7	68·7	48·2	9th	75·5	22nd	·515	77	54	8th
May -	29·950	71·2	68·7	62·6	74·9	57·4	12th	80·9	31st	·658	83	64	1st
June -	29·994	78·1	75·9	70·4	81·5	64·0	8th	85·5	30th	·841	85	58	5th
July -	30·099	82·8	80·2	74·2	86·2	71·0	5th	89·3	25th	·893	77	68	14th
August -	29·948	82·3	80·0	74·2	85·9	70·0	21st	90·9	17th	·904	79	66	15th
September	29·944	80·3	78·1	73·0	83·3	68·8	24th	87·5	1st	·861	81	62	28th
October -	29·882	74·0	72·4	68·5	76·4	63·0	31st	82·7	3rd	·700	82	63	28th
November	30·096	69·5	68·3	64·0	72·6	56·2	15th	77·1	9th	·554	81	64	5th
December	29·932	65·0	64·6	60·5	68·8	50·8	27th	76·1	5th	·555	86	71	24th
Year -	29·959	71·4	69·8	64·8	74·8	45·8	22 Feb.	90·9	17 Aug.	·658	81	54	8th April

FORT CANNING, SINGAPORE. Lat. 1° 16′ N.

Month.	Mean Pressure corrected and reduced to 32° Fahrenheit.	Mean at 9 a.m.	Mean Daily.	Means of Min.	Means of Max.	Abs. Min. Temp.	Abs. Min. Day.	Abs. Max. Temp.	Abs. Max. Day.	Tension of Vapour.	Relative Humidity Mean.	Min. Per Cent.	Min. Day.
January -	29·746	80·3	79·3	71·8	86·8	70·0	11, 12, 14, 15	91·0	31st	·763	68	55	10, 20, 23rd
February	29·755	81·2	80·6	72·9	88·4	70·0	28th	91·6	27th	·782	68	52	10, 22
March -	29·709	82·6	81·9	73·7	90·2	71·0	1st	93·8	13th	·828	69	47	12th
April -	29·682	84·2	82·9	74·6	91·2	73·0	3, 7, 28	94·8	26th	·848	67	57	10th
May -	29·689	85·5	84·0	76·2	91·8	73·0	6, 12th	96·0	20, 24th	·855	67	53	20th
June -	29·685	83·0	82·5	75·7	89·4	70·0	28th	94·4	23rd	·872	73	51	23rd
July -	29·701	83·7	83·0	75·7	90·3	71·0	11th	93·0	7, 8th	·866	70	56	1, 2nd
August -	29·740	82·5	82·2	75·0	89·4	71·0	28th	94·0	1, 11th	·864	72	59	1, 7th
September	29·743	83·6	82·5	74·9	90·2	71·0	2, 19th	93·8	7th	·875	71	57	13, 17 7th
October -	29·765	82·8	82·0	74·2	89·9	71·0	23rd	92·4	24th	·867	75	59	11th
November	29·723	81·4	81·3	73·7	88·9	72·3	6th	92·4	20th	·873	76	62	14th
December	29·759	78·4	78·6	72·8	84·4	70·0	25th	90·0	16, 18th	·861	84	63	5th
Year -	29·725	82·4	81·7	74·3	89·2	70·0	11, 12, 14, 15 Jan. 28 Feb. 28 June 25 Dec.	96·0	20, 24th May	·846	72	47	12th Mar.

No. XV.—*continued.*

at Netley and Stations Abroad in the Year 1896.

Long. 64° 47′ W. Height of Barometer Cistern above Sea, 151 feet.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.								
				Number of Days of								No of Observations under each Point per Month.								
	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
7·5	6·86	2·49	10th	20	—	1	—	—	—	13	—	10	—	1	4	4	12	4	18	9
7·3	5·18	1·53	25th	21	—	1	1	—	—	12	—	2	1	1	2	7	25	3	12	5
7·8	8·39	1·79	1st	19	—	3	2	—	—	9	1	2	3	1	4	8	13	3	13	15
5·2	1·70	0·96	22nd	9	—	—	1	—	3	4	—	6	4	1	1	—	9	5	14	20
5·9	2·84	1·03	8th	6	—	—	1	—	5	11	—	5	7	—	4	13	20	1	6	6
7·9	4·10	1·36	11th	12	—	—	—	—	1	10	—	5	1	—	2	25	21	2	2	2
5·6	2·10	0·88	17th	14	—	—	—	—	1	4	—	2	4	6	14	9	17	4	2	4
5·2	4·61	1·36	1st	18	—	—	2	—	2	6	—	10	2	3	6	10	14	6	5	6
6·6	7·10	1·43	3rd	17	—	—	1	—	—	10	—	4	10	5	7	13	9	—	1	11
6·3	6·79	2·15	14th	15	—	—	2	—	—	7	—	14	9	5	6	12	9	2	2	3
5·2	3·61	1·80	9th	14	—	—	—	—	6	3	—	8	19	9	1	4	1	2	2	14
7·6	6·40	1·51	16th	23	—	—	—	—	—	15	—	8	7	—	2	8	11	6	13	7
6·5	59·68	2·49	10th Jan.	183	—	5	10	—	18	104	1	76	67	32	53	113	161	38	90	102

Long. 103° 53′ E. Height of Barometer Cistern above Sea, 110 feet.

Mean Amount of Cloudiness.	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
6·0	4·24	1·45	2nd	9	—	—	—	—	—	6	—	—	36	—	—	—	—	—	7	19
6·0	4·79	1·10	10th	9	—	—	3	—	—	8	—	—	45	—	—	—	—	—	1	12
5·5	5·92	1·50	20th	12	—	—	8	—	—	8	—	—	26	—	—	1	—	—	13	22
4·5	3·54	1·65	5th	9	—	—	2	—	—	2	—	3	3	—	—	—	1	3	19	31
4·5	3·09	1·68	6th	8	—	—	3	—	—	6	—	—	—	—	—	—	5	2	6	49
6·5	5·26	1·70	4th	14	—	—	—	—	—	18	—	—	—	—	—	7	3	8	1	41
6·5	5·22	1·80	17th	12	—	—	6	—	—	13	—	—	—	—	—	7	9	3	—	43
6·5	6·66	2·24	19th	13	—	—	8	—	—	16	—	—	—	—	—	5	3	4	—	50
5·5	4·36	1·35	15th	10	—	—	6	—	—	5	—	—	—	—	—	5	2	1	1	51
6·0	6·52	1·90	7th	10	—	—	4	—	—	12	—	—	—	—	1	3	3	8	15	32
6·5	6·27	1·19	12th	17	—	—	4	—	—	15	—	3	3	—	—	—	3	5	17	29
8·0	11·73	2·70	24th	24	—	—	5	—	—	30	—	4	1	—	—	—	—	—	37	20
6·0	67·60	2·70	24th Dec.	147	—	—	49	—	—	139	—	10	114	—	1	28	29	34	117	399

Appendix

Annual Abstract of Meteorological Observations taken

HONG KONG. Lat. 22° 16′ 20″ N.

Month.	Mean Pressure — Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Minimum.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per Cent.	Day.
January -	30·146	62·8	64·4	58·9	69·9	52·0	2nd	79·5	10th	·488	79	55	22nd
February -	30·135	56·8	57·6	54·4	60·7	43·0	16th	69·0	2nd	·428	89	75	19, 20
March -	30·161	60·8	61·8	57·2	66·4	47·0	21, 23rd	79·5	27th	·502	87	70	3rd
April -	29·882	73·5	73·9	70·4	77·4	60·0	2nd	86·0	25th	·735	85	67	27th
May -	29·885	79·2	78·7	73·3	84·1	65·5	8th	93·5	31st	·790	76	54	15th
June -	29·775	83·7	83·6	78·4	88·7	74·0	3rd	94·0	1st	·919	79	61	15th
July -	29·581	85·8	85·6	80·6	90·6	76·0	30th	96·5	21st	·930	74	51	7th
August -	29·726	85·5	84·7	78·9	90·6	76·0	3rd	94·5	24th	·922	73	61	8, 13
September	29·824	84·2	83·4	78·2	88·6	75·0	9th	93·0	4th	·966	78	61	10th
October -	29·952	80·1	79·9	74·9	84·9	68 5	31st	93·5	4th	·814	76	56	22nd
November	29·941	80·6	80·4	75·6	85·3	69·0	14th	93·5	4th	·832	78	56	22nd
December	30·171	64·1	64·0	58·4	69·6	46·0	24th	79·0	17, 20th	·461	71	47	6th
Year -	29·932	74·8	74·8	69·9	79·7	43·0	16 Feb.	96·5	21 July	·732	79	47	6th Dec.

SANITARIUM, HONG KONG. Lat. 22° 16′ 20″ N.

Month.	Mean Pressure and Mean at 9 a.m.	Mean daily.	Means of Min.	Means of Max.	Abs. Min. Temp.	Abs. Min. Day.	Abs. Max. Temp.	Abs. Max. Day.	Tension of Vapour and Relative Humidity
January -	No instruments.								No instruments.
February -									
March -									
April -									
May -									
*June -		78·0	71·3	84·7	67·5	11th	89·0	29, 30th	
†July -		81·3	75·3	87·3	72·0	3, 10, 12, 15th	92·5	23rd	
†August -		—	—	—	—	—	—	—	
September		78·5	71·3	85·6	69·5	9, 13, 14, 15, 18th	93·0	4th	
October -		73·9	66·8	81·0	57·5	31st	89·5	5th	
‡November		68·4	61·3	75·5	57·0	1st	79·0	3rd	
December -									

26 days only. † Observatory destroyed 29th July. Instruments removed until 25th August.
‡ 4 days only

No. XV.—*continued.*

at Netley and Stations Abroad in the Year 1896.

Long. 114° 8′ 16″ E. Height of Barometer Cistern above Sea, 18 feet.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.								
				Number of Days of								Number of Observations under each Point per Month.								
	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	NW.	Calm.
6·6	3·42	1·81	31st	10	—	—	—	—	5	17	—	—	9	27	3	—	—	1	2	20
9·4	5·53	1·08	22nd	23	—	—	—	—	—	26	—	—	4	36	—	—	—	—	1	17
9·0	1·74	0·54	11th	8	—	—	—	—	1	25	—	3	8	31	—	—	—	2	—	18
8·3	2·68	1·30	10th	11	—	—	2	—	3	23	—	—	2	36	5	—	—	1	—	16
5·5	1·18	0·65	6th	10	—	—	—	—	6	9	—	—	1	20	5	1	7	4	—	24
6·7	17·42	3·50	22nd	22	—	—	—	—	—	8	—	—	3	21	7	2	4	11	1	11
5·6	14·71	3·20	29th	17	—	—	3	—	2	9	1	—	5	18	16	1	9	10	—	3
4·4	5·92	1·30	5th	13	—	—	—	—	2	5	—	1	8	13	14	3	1	6	3	13
5·8	11·30	2·48	16th	18	—	—	1	—	3	9	—	1	8	19	5	—	—	4	1	22
5·2	9·21	4·76	6th	11	—	—	—	—	10	11	1	2	12	22	1	—	—	3	2	20
5·1	8·76	4·76	6th	7	—	—	—	—	10	10	—	2	8	24	1	—	—	3	2	20
4·3	1·53	1·22	2nd	3	—	—	—	—	12	8	—	9	6	21	—	—	—	—	1	25
6·3	83·40	4·76	6 Oct. 6 Nov.	153	—	—	6	—	54	160	2	18	74	288	57	7	21	45	13	209

Long. 114° 9′ 16″ E. Height of Barometer Cistern above Sea, 911 feet.

6·5	12·31	3·00	22nd	20	—	—	4	1	—	9	—	—	4	2	18	5	5	—	—	18
5·5	9·67	2·45	8th	15	—	—	3	—	6	12	1	—	14	3	18	5	2	—	—	20
4·5	—	—	—	6	—	—	—	—	6	5	—	—	14	14	12	—	—	—	—	23
6·0	10·55	2·70	16th	17	—	—	1	1	1	6	—	—	16	4	19	—	2	—	2	17
5·5	7·95	3·60	6th	11	—	—	—	—	—	6	1	3	40	3	3	5	—	—	1	7
6·0	—	—	—	—	—	—	—	—	—	2	—	—	8	—	—	—	—	—	—	—

Appendix

Summary of Results of Meteorological Observations

Stations.	Altitude, above Sea Level.	Latitude.	Longitude.	Mean Daily Air Temp.	Air Pressure—corrected and reduced to 32° F.	Air Temperature.							Tension of Vapour.	Relative Humidity.		
						Mean, 9 a.m.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Min.	
							Min.	Max.	Temp.	Date.	Temp.	Date.		Mean.	Per Cent.	Date.
Mediterranean:	ft.	° ′ ″	° ′ ″													
Gibraltar -	52	36 6 20 N.	5 20 53 W.	64·2	30·010	62·1	58·0	70·3	41·0	21 Dec.	90·4	25 Sept.	·430	70	29	6 July
Malta -	112	35 53 49 N.	14 30 54 E.	66·3	29·826	66·1	62·0	70·7	45·2	8 Jan.	96·8	11 Aug.	·471	69	31	19 July
Scutari -	60	41 0 0 N.	29 3 0 E.	58·8	29·905	58·1	49·9	67·6	23·8	18 Feb.	107·6	13 Aug.	·375	67	27	12 Aug.
Cyprus: Polymedia	460	34 42½ 0 N.	30 1 0 E.													
Mt. Troodos	5,700	34 54 0 N.	32 53 0 E.													
Natal, Fort Napier.	2,220	39 3 0 S.	30 2 0 E.	69·1	27·688	69·7	55·7	82·6	34·2	21 June 25 July	107·8	4 Mar.	·485	61	32	16, 21 May 20, 21 July 19 Aug. 1, 4, 11 Sept.
Sierra Leone -	224	8 29 30 N.	13 9 17 W.	81·0	29·720	81·4	74·2	87·9	69·0	29, 31 May	99·8	29 Mar.	·807	72	34	28, 29 Dec.
West Indies: Barbados -	30¾	13 7 39 N.	59 40 8 W.	77·4	30·040	82·5	67·7	87·3	55·8	1 Feb.	91·6	29 Aug.	·776	69	43	11 Mar. 5 April
Jamaica: Up Park Camp.	245	17 59 0 N.	76 56 0 W.	82·3	29·765	85·4	71·3	93·3	61·0	15 Jan.	101·6	8 Sept.	·748	60	34	22 July
Newcastle -	3,800	18 0 6 N.	76 0 42 W.	65·6	26·326	72·8	53·5	77·8	43·4	2 July	87·0	11 Oct.	·578	73	45	4 Mar.
St. Lucia -	744	14 0 13 N.	61 0 25 W.	*	29·182	78·1	*	84·1	*	*	89·2	11 Oct.	·755	75	50	4 April
Bermuda -	151	32 17 40 N.	64 47 0 W.	69·8	29·959	71·4	64·8	74·8	45·8	22 Feb.	90·9	17 Aug.	·658	81	54	8 April
Singapore: Fort Canning	110	1 16 0 N.	103 53 0 E.	81·7	29·725	82·4	74·3	89·2	70·0	11, 12, 14, 15 Jan. 28 Feb. 28 June 25 Dec.	96·0	20, 24 May	·846	72	47	12 Mar.
Hong Kong -	18	22 16 20 N.	114 8 16 E.	74·8	29·932	74·8	69·9	79·7	43·0	16 Feb.	96·5	21 July	·732	79	47	Dec.
„ Sanitarium -	911	22 16 20 N.	114 9 16 E.													

* Minimum thermometer defective.

No. XV.—*continued.*

taken at Foreign Stations in the Year 1896.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.									No. of Month in which Observations were taken.
				Number of Days of								Number of Observations under each Point per Month.									
	Total.	Max.	Date.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	NW.	Calm.	
3·7	29·75	3·40	11 Jan.	67	—	—	6	1	121	43	32	7	8	330	8	3	50	203	86	37	12 months.
4·9	21·48	3·07	24 Nov.	89	—	—	14	—	46	46	—	55	124	47	107	27	76	73	210	13	12 ,,
5·0	21·83	1·75	16 Dec.	109	32	4	17	16	83	91	—	75	282	69	24	86	108	5	6	77	12 ,,
																					7 ,,
																					5 ,,
4·2	38·43	5·24	17 Dec.	120	—	2	45	5	126	71	6	2	7	10	8	—	4	—	6	695	12 ,,
2·9	208·55	10·07	3 Aug.	170	—	—	105	—	32	—	—	48	16	82	80	107	72	198	17	172	12 ,,
5·3	62·81	2·67	6 Dec.	223	—	—	9	—	3	31	—	1	125	246	232	8	1	—	—	119	12 ,,
4·8	23·62	1·80	2 Sept.	89	—	—	10	—	15	77	—	21	82	2	354	25	109	25	60	54	12 ,,
5·0	101·44	4·25	1 Oct.	213	—	—	25	—	29	20	1	48	136	31	48	—	—	1	52	416	12 ,,
3·7	†	†	†	280	—	—	16	—	—	39	—	35	338	207	147	—	—	3	2	—	12 ,,
6·5	59·68	2·49	10 Jan.	183	—	5	10	—	18	104	1	76	67	32	53	113	161	38	90	102	12 ,,
6·0	67·60	2·70	24 Dec.	147	—	—	49	—	—	139	—	10	114	—	1	28	29	34	117	399	12 ,,
6·3	83·49	4·76	6 Oct. 6 Nov.	153	—	—	6	—	54	160	2	18	74	288	57	7	21	45	13	209	12 ,,
																					,,

† Rain gauge defective 20th and 21st November.

APPENDIX No. XVI.

THE PARKES MEMORIAL PRIZE.

Surgeon-Major-General J. Jameson, M.D., C.B., Director-General, *President of Committee.*

Surgeon-Colonel J. Lane-Notter, M.A., M.D., *Treasurer.*

Surgeon-Captain W. H. Horrocks, M.B., B.Sc., *Secretary.*

Prize Essay Medallists.

1883. Surgeon R. J. Polden, Indian Medical Service.
1886. Surgeon A. Duncan, M.D., Indian Medical Service.
1889. Surgeon R. H. Firth, F.R.C.S. Eng., Medical Staff.
1892. Surgeon-Captain R. H. Firth, F.R.C.S. Eng., Army Medical Staff.
1895. Surgeon-Major R. Ross, Indian Medical Service.

The following is the subject for the next prize:—

"Venereal Diseases in the British and Indian Armies—their Prevalence and Prevention."

The Prize is Seventy-five Guineas in Money and a Bronze Medal, and is awarded Triennially.

The Competition is open to all Medical Officers of the Army, Navy, and Indian Services of Executive Rank on full pay, with the exception of the Assistant Professors of the Army Medical School during their term of Office, Essays to be sent to the Secretary of the "Parkes Memorial Fund," Royal Victoria Hospital, Netley, on or before the 31st day of December 1900. Each Essay to have a Motto, and to be accompanied with a sealed envelope bearing the same Motto and containing the name of the Competitor.

APPENDIX No. XVII.

THE ALEXANDER MEMORIAL FUND.

Trustees.

Surgeon-Major-General J. Jameson, M.D., C.B., Director-General.
Surgeon-Major-General J. B. C. Reade, C.B., Q.H.S.
Deputy-Surgeon-General W. G. Don, M.D.

Committee.

Surgeon-Major-General J. Jameson, M.D., C.B., Director-General, *President.*
Surgeon-Major-General J. B. C. Reade, C.B., Q.H.S.
Deputy-Surgeon-General W. G. Don, M.D.
Surgeon-Colonel W. F. Stevenson, M.B.
Brigade-Surgeon-Lieutenant-Colonel A. F. S. Clarke, M.D.
Brigade-Surgeon-Lieutenant-Colonel W. Johnston, M.D.
Surgeon-Major W. G. A. Bedford, M.B., *Honorary Secretary.*

Prize Essay Gold Medallists.

1870.	Assistant Surgeon A. B. R. Myers, Coldstream Guards.
1873.	Surgeon F. H. Welch, F.R.C.S. Eng., Medical Department.
1876.	Surgeon-Major J. H. Porter, Medical Department.
1879.	Surgeon John Martin, Medical Department.
1882.	Surgeon-Major F. H. Welch, F.R.C.S. Eng., Medical Department.
1885.	Surgeon John Martin, Medical Staff.
1888.	Surgeon R. H. Firth, F.R.C.S. Eng., Medical Staff.
1891.	Surgeon R. H. Firth, F.R.C.S. Eng., Medical Staff.
1894.	Surgeon-Captain C. Birt, Army Medical Staff.
1897.	Surgeon-Major C. Birt, Army Medical Staff.

At a meeting of the Committee held at 18, Victoria Street, S.W., on 31st March 1897, the prize of 50*l.* and Gold Medal of the value of 10*l.* was awarded to Surgeon-Major C. Birt, Army Medical Staff, for the best Essay on "Micro-organisms as Factors in the Production of Phthisis; the Influence "of Military Service upon the Disease, and Suggestions for its Prevention "in the Army."

The essays of the unsuccessful competitors will be returned on application to the Honorary Secretary before 31st December 1898. Those of the unsuccessful competitors on the former occasion have, in accordance with the rules, been destroyed.

The subject for the next competition is "Injuries to joints and long bones "caused by modern small-arm projectiles: their nature, diagnosis, and "treatment: with special reference to the appliances required and available "on field service."

Essays must reach the President of the Committee on or before 31st December 1899.

Essays are to be legibly written, superscribed with a brief motto, and accompanied by a sealed envelope similarly superscribed, containing the name and address of the author.

No essay shall exceed in length fifty pages of ordinary printed octavo, which may be estimated as amounting to 20,000 words. This limit is exclusive of tables which may be added in the form of appendices.

The competition is limited to executive officers of the Army Medical Staff on full pay; but Professors and Assistant Professors at Netley are not allowed to compete while so employed.

By order of the Committee,
W. G. A. Bedford, Surgeon-Major, *Hon. Sec.*